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Technical Report No. 1

Environment Pattern Reconstruction
from Sample Data. I. Mississippi
Delta Region

by

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ABSTRACT

A ten percent random sample of map data is judged adequate to reproduce the first order spatial characteristics of the distribution pattern for the seven major types of depositional environments in the Mississippi Delta region of Southeast Louisiana. This conclusion is based on: 1) dendrographs which portray interdistance relationships among mean coordinate locations for the different environments, 2) the sampling properties of the Goodman-Kruskal measure of cross association as it is applied to nearest unlike neighbor samples, and 3) proximal maps which are reconstructions of the original pattern based on sample data.

In analyzing map patterns, principal component analysis can be used to depict spatial trends. Within the Mississippi Delta region, the natural levee, point bar, bay-sound, and beach environments show a marked linear trend whereas the swamp, lacustrine, and marsh environments are more isotropic. With respect to location, the lacustrine environment is situated in an intermediate position between nonmarine and marine depositional environments.

The total sample of 4025 data points taken from the environment distribution map of the Mississippi Delta region on which this study is based is contained in the Appendix.

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Introduction

The detection of spatial order within a depositional environmental framework is dependent upon the elusive relationship that exists between the spatial arrangement and size of the areal units of observation and the degree of complexity of the underlying pattern. Traditionally, the interpretation of environmental map patterns has been accomplished by subjective analysis. Progress toward a more quantitative approach has been handicapped by the lack of suitable statistical measures for describing the spatial character of depositional environmental patterns by which different patterns can be compared and those obscured because of limited areal sampling detected. The primary objective of the present research is to develop a statistical methodology for analyzing environmental map patterns from the point of view that, ultimately, it should be possible to set minimum sampling requirements in advance of regional environmental studies in offshore areas where only limited sampling is economically justified.

Within the past decade, a considerable literature has emerged in the field of human geography, epidemiology, and quantitative plant ecology which relate to spatial analysis ([1],[2]). An excellent review article has appeared recently relating the analysis of spatial form to geographic theory [3]. For the most part, the studies have concentrated on areally distributed point processes where data are generated within artificially defined boundaries. For environments, the boundaries bear no direct relationship to geographic coordinates and the type of patterns found are best described as multiphase mosaics. The closest approach to the quantitative study of environment distribution patterns has been in the field of ecology [4]. There needs to be developed in geology statistical measures which will describe the spatial structure of environment distribution patterns. The statistical properties of such measures based on different size samples under different sampling plans could then be established. This report describes the results of a preliminary study directed toward this end.

percentage. The percentages reflect the relative areas covered by each of the different environments. Such information is of value in comparing environment areal coverage with other deltaic complexes. If we define the Total Information (T.I.) obtained from sampling as

$$T.I. = \sum_{j=1}^7 j n_j$$

where n_j is the number of areal units of observation which contained j different environments, it is found that $T.I.=6296$. The portion of the total information used in this study comprised only the environment data gathered from the randomly located points within the areal observation units. This Relative Information (R.I.) defined as

$$R.I. = T.I. / \sum_{j=1}^7 n_j$$

is equal to .62 or 62 percent. While this may seem like an undue degradation of the original information, over one half of the areal units of observation contained only a single environment while ninety-two percent contained no more than two. For now at least, the areal coverage as represented by the sample is considered adequate. It may be necessary later to make more complete use of the original information.

Spatial Form

Beyond the direct observation of environment distribution maps and subsequent subjective evaluations, it is useful to have graphical aids for characterizing pattern structure. Two new forms of graphic display have been developed: 1)spatial principal components, and 2)environment centroid interdistance dendrographs. Each can be illustrated using the environmental data gathered in this study.

Spatial principal component analysis provides a rapid and effective means of portraying the spatial

one grid unit equals approximately 1.5 miles. Only one half of the matrix is filled due to the symmetry. Based on an unweighted pair group clustering of the coefficients, the dendrograph shown in Figure 4 is produced. The dendrograph depicts the marine versus nonmarine associations of the seven major environments. Further, it reveals the transitional character of the lacustrine environment. With a smaller sample, a similar pattern should result within statistical limits. Here again, statistical tests need to be developed. To see what does happen with a smaller sample, a random sample of 500 from the total of 4025 areal units of observation was chosen. The dendrograph that resulted is shown in Figure 5. While some rearrangement of the environments takes place, the basic pattern remains the same. As a first approximation, it is reasonable to conclude that the pattern generated from a sample of 500 points preserves the spatial order contained within the original data.

Proximal Maps

It is not enough to reproduce the spatial order within environment map patterns based on summary statistics calculated from sample data but in addition, it is further desirable to reconstruct the underlying pattern. The problem of reconstructing patterns from sample data has been considered in the context of locating sample points in a way which minimizes the loss due to misclassification in the pattern reconstruction based on nearest neighbor relations [8]. For m-color patterns having a definite cell structure, it is possible to obtain an optimal sample spacing. For more complex patterns, however, such as are found in natural environments, the determination of an optimal spacing in closed form is rendered virtually intractable.

In an attempt to determine the effectiveness of pattern reconstruction of the Mississippi Delta complex based on sample data, a series of sampling experiments were performed in which random samples and subsequently systematic samples were drawn from the total population and the derived data used to generate proximal maps using the SYMAP computer program [9]. The different sample sizes drawn were 5,

Study Area and Population Sample

For this pilot study, it was decided to choose an area which had been mapped in considerable detail and which contained diverse environment elements arranged in a complex pattern. Further, it was desired that such an area would be representative of a major depositional environment framework found both in the Recent and in the geologic past. The area which best suited these requirements was the Mississippi Delta Region of Southeastern Louisiana. The Mississippi Delta complex is probably the best known of the world's delta systems. This area has been studied and extensively mapped over a period of several decades. The recent deposits, their depositional environments and areal distribution have been well documented ([5],[6]). The depositional environments of the Mississippi Delta complex excluding the offshore can be broadly subdivided into seven major types. These are the 1) natural levee, 2) point bar, 3) swamp, 4) marsh, 5) beach, 6) lacustrine, and 7) bay-sound. The areal distribution of these seven major environments is shown in Figure 1. This map constitutes the source of data for the present study.

The initial step was to convert the pattern represented in Figure 1 into digital form by superposing a fine mesh grid over the map and record the environments present within each areal unit of observation. For practical purposes, it was desired to obtain a point representation of the environment distribution pattern and so the type of environment chosen as representative of each areal unit was determined as that one which was situated at a randomly located point within. The grid overlay used to sample the deltaic complex pattern is shown in Figure 2. The finer grid containing one hundred areal units of observation each with a point located at random within was moved over the coarser grid which encompassed the map area to be sampled. The data obtained in this manner are listed in the Appendix. A total of 4025 areal units of observation were recorded. The aggregate composition of the environments contained within these areal units is given in Table 1. The eighth column in Table 1 lists the total number of each type of environment recorded at the points located at random within the areal units of observation and the last column gives the

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Beyond the direct observation of environment distribution maps and subsequent subjective evaluations, it is useful to have graphical aids for characterizing pattern structure. Two new forms of graphic display have been developed: 1) spatial principal components, and 2) environment centroid interdistance dendrographs. Each can be illustrated using the environmental data gathered in this study.

Spatial principal component analysis provides a rapid and effective means of portraying the spatial

trend for a particular environment. Let $V = \{(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n); (x_k, y_k) \in E_j\}$ be defined as the set of paired x-y coordinates of the data representing the areal distribution of the jth environment, E_j . The principal components of which there are two are defined by

$$CP = \lambda P$$

where C is the covariance matrix of the x-y coordinates of V , P is a 2x2 orthogonal matrix whose column vectors are the linear coefficients of the first and second principal components, respectively, and λ is a 2x2 diagonal matrix whose diagonal elements represent the variance of each of the respective principal components. In the present context, these can be referred to as the spatial components. The spatial components for the seven major environments of the Mississippi Delta are shown in Figure 3. The axes for each of the environments is centered about the mean x-y position for each set of coordinates and the length of each axis is taken as twice the standard deviation. The orientation of the axes is determined by the linear coefficients of the component vectors. The spatial trends are readily observable. The elongate shapes of the natural levee, point bar, and the beach environments can be seen along with the more isotropic patterns of the swamp, marsh, and lacustrine environments. Rather surprising is the sharpness of the trend for the bay sound environment. Considering the depositional aspect, the first principal component whose axis is longest, gives the depositional strike of the sediments. It is indicative of the direction of sediment transport for fluvial and current related deposits. For a more limited sampling of the area than was undertaken in the present study, from such sampling if it is to be considered adequate, it should be possible to reproduce the spatial trends indicated in Figure 3. Statistical tests of significance should be developed.

A lower order measure of spatial structure are dendrographs which portray the interdistance relationships between the coordinate mean positions of the different environments. For the Mississippi Delta data, the matrix of pairwise mean coordinate positions for the seven major environments is given in Table 2. The interdistances are expressed in grid units where

one grid unit equals approximately 1.5 miles. Only one half of the matrix is filled due to the symmetry. Based on an unweighted pair group clustering of the coefficients, the dendrograph shown in Figure 4 is produced. The dendrograph depicts the marine versus nonmarine associations of the seven major environments. Further, it reveals the transitional character of the lacustrine environment. With a smaller sample, a similar pattern should result within statistical limits. Here again, statistical tests need to be developed. To see what does happen with a smaller sample, a random sample of 500 from the total of 4025 areal units of observation was chosen. The dendrograph that resulted is shown in Figure 5. While some rearrangement of the environments takes place, the basic pattern remains the same. As a first approximation, it is reasonable to conclude that the pattern generated from a sample of 500 points preserves the spatial order contained within the original data.

Proximal Maps

It is not enough to reproduce the spatial order within environment map patterns based on summary statistics calculated from sample data but in addition, it is further desirable to reconstruct the underlying pattern. The problem of reconstructing patterns from sample data has been considered in the context of locating sample points in a way which minimizes the loss due to misclassification in the pattern reconstruction based on nearest neighbor relations [8]. For m-color patterns having a definite cell structure, it is possible to obtain an optimal sample spacing. For more complex patterns, however, such as are found in natural environments, the determination of an optimal spacing in closed form is rendered virtually intractable.

In an attempt to determine the effectiveness of pattern reconstruction of the Mississippi Delta complex based on sample data, a series of sampling experiments were performed in which random samples and subsequently systematic samples were drawn from the total population and the derived data used to generate proximal maps using the SYMAP computer program [9]. The different sample sizes drawn were 5,

10,20,50,100,200, and 500, respectively. A proximal map is generated by assigning to each location on a fixed grid the type environment found for the nearest sample. Thus, proximal maps follow a nearest neighbor rule in their construction. Figures 6 and 7 contain proximal maps of the Mississippi Delta reconstruction for the different sample sizes noted above obtained for random samples and for systematic samples, respectively. In viewing the sequence of maps, the continuity of the natural levee environment does not become apparent until the sample size has reach 500. Furthermore, given the choice between random samples and systematic samples the latter are preferable since greater detail in the pattern structure results. Proximal maps produced in this way reveal the evolving pattern structure. The important question is how to decide when sufficient samples have been collected. It is anticipated some kind of multi-stage sampling procedure will be found to be optimal.

Pattern Cross Association

In addition to graphic forms which characterize the spatial order within environment distribution patterns and pattern reconstructions based on sample data, there needs to be devised statistical measures of map pattern structure. Such measures would be of value in assessing the relative strength of a given pattern and for comparing one pattern with another. More important, they could provide a means for determining the minimum sample size necessary to achieve a prespecified level of confidence in establishing a particular type pattern. The interpretation that is given to point patterns derives largely from nearest neighbor relations. In the Mississippi Delta data, the areal distribution pattern is defined by the type of environment occurring at the various grid locations. It is worthwhile to consider the degree of cross association that exists between the type of environment and the nearest sample. Since, for different environments, different areal coverages are involved, it is advantageous to consider the cross association that exists between samples and the nearest sample at which a different type environment is observed. This is referred to as the nearest unlike neighbor. For the Mississippi Delta data, the matrix of

nearest unlike neighbors is given in Table 3. The last row and column give the row and column sums, respectively. As a measure of cross association, the Goodman-Kruskal measure, λ_b , has been used [10]. This statistic measures the relative decrease in probability of error in trying to predict the nearest unlike neighbor of a sample point. For a given set of observations, λ_b is defined as

$$\lambda_b = \frac{\sum_{a=1}^m v_{am} - v_{.m}}{v - v_{.m}}$$

where v_{am} is the largest entry in the ath row, $v_{.m}$ is the largest entry for the column sums and v is the sample size. For the matrix in Table 3, $\lambda_b = .356$. This is interpreted as the measure of pattern strength for the areal distribution pattern represented in Figure 1.

It is of interest to consider the sampling properties of λ_b for different size samples. This kind of information is a prelude for determining a minimum sample size. As an initial experiment, random samples of size 10, 20, 50, and 100 were drawn from the total of 4025. For each sample size, the sampling was repeated 10, 20, 50, 100, 200, 500, and 1000 times. For each set of repeated sampling for fixed sample size, the average value of λ_b was calculated. The results are shown in Figure 8. The damped oscillatory behavior of the observed values with increasing sample size is readily apparent. From these curves, it was possible to establish a product sampling rule of the form

$$S = kn$$

where S represents the total sample, k is the number of repeated sampling for a sample size n . For $S = 1000$, the following values of k and n were selected: 100, 10 (k, n); 50, 20; 20, 50; 10, 100; 5, 200; 1, 1000. The results of random sampling according to this rule in which the average values of λ_b were calculated are shown in Figure 9. From this, it is inferred that a size somewhere in the range from 200 to 500 random samples would be adequate for reproducing the nearest unlike neighbor relations

that exist for the population.

Summary

The primary aim of this preliminary investigation has been to develop graphical aids for describing the spatial form of environment distribution patterns. Spatial principal components and dendrographs depicting interdistance environmental relations both have proven effective. Pattern reconstruction from sample data has been accomplished by proximal mapping. The most important consideration, however, is the problem of minimum sample size required to reproduce a given pattern structure. For the Mississippi Delta complex considered in this study, a threefold argument based on environmental mean coordinate interdistance dendrographs, proximal maps, and cross association measures of nearest unlike neighbors leads to the conclusion that a ten percent random sample of the total area in the delta is sufficient to reproduce the underlying pattern structure. Systematic sampling leads to a more accurate representation while multistage sampling is expected to yield optimal results.

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Table 1

Population characteristics of environmental sample from Mississippi Delta region

Type environment	Number of different environments contained within each areal unit of observation classified according to the environments which were situated at the randomly chosen points in the grid								
	1	2	3	4	5	6	7	Σ	%
natural levee	182	317	49	5	0	0	0	553	14
point bar	6	36	4	0	0	0	0	46	1
swamp	303	264	69	1	0	0	0	637	16
marsh	687	539	110	3	0	0	0	1339	34
beach	0	9	8	0	0	0	0	17	<1
lacustrine	291	174	17	0	0	0	0	482	11
bay-sound	660	237	54	0	0	0	0	951	24
n_j	2129	1576	311	9	0	0	0	4025	100

Table 2

Matrix of pairwise interdistance mean coordinates of major depositional environments of the Mississippi Delta region. The interdistances are expressed in grid units where one grid unit equals approximately 1.5 miles.

	natural levee	point bar	swamp	marsh	beach	lacus- trine
point bar	11					
swamp	8	11				
marsh	24	34	25			
beach	42	51	40	17		
lacustrine	21	26	16	18	28	
bay-sound	45	52	42	24	12	26

Table 3

Matrix of the number of nearest unlike neighbors for population sample from the Mississippi Delta region. The last row and column contain the row and column sums, respectively.

	natural levee	point bar	swamp	marsh	beach	lacus- trine	bay- sound	Σ
natural levee	-	117	286	148	0	2	0	553
point bar	38	-	5	2	0	0	1	46
swamp	301	10	-	175	1	138	12	637
marsh	538	3	168	-	29	320	281	1339
beach	0	0	0	9	-	0	8	17
lacus- trine	2	0	168	292	0	-	20	482
bay- sound	0	1	147	617	161	25	-	951
Σ	879	131	774	1243	191	485	322	4025

Figure 1. Depositional environments in Mississippi
Delta region after Kolb, et al.[7].

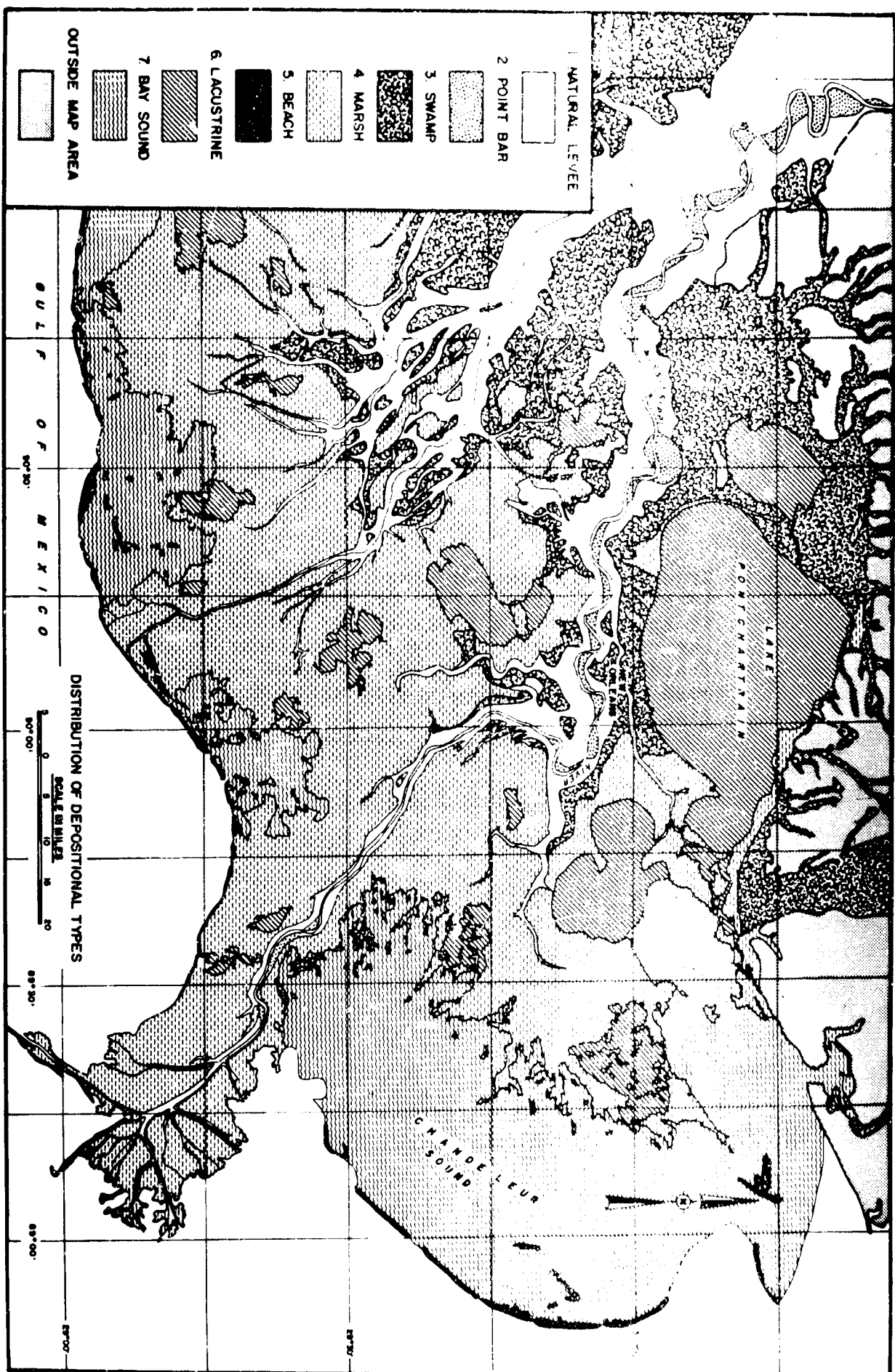


Figure 2. Grid overlay used to sample areal pattern in Figure 1. Each areal unit of observation is specified by a Block number defined for the coarser grid and by a Grid number defined for the finer grid. A randomly located point lies within each areal observation unit.

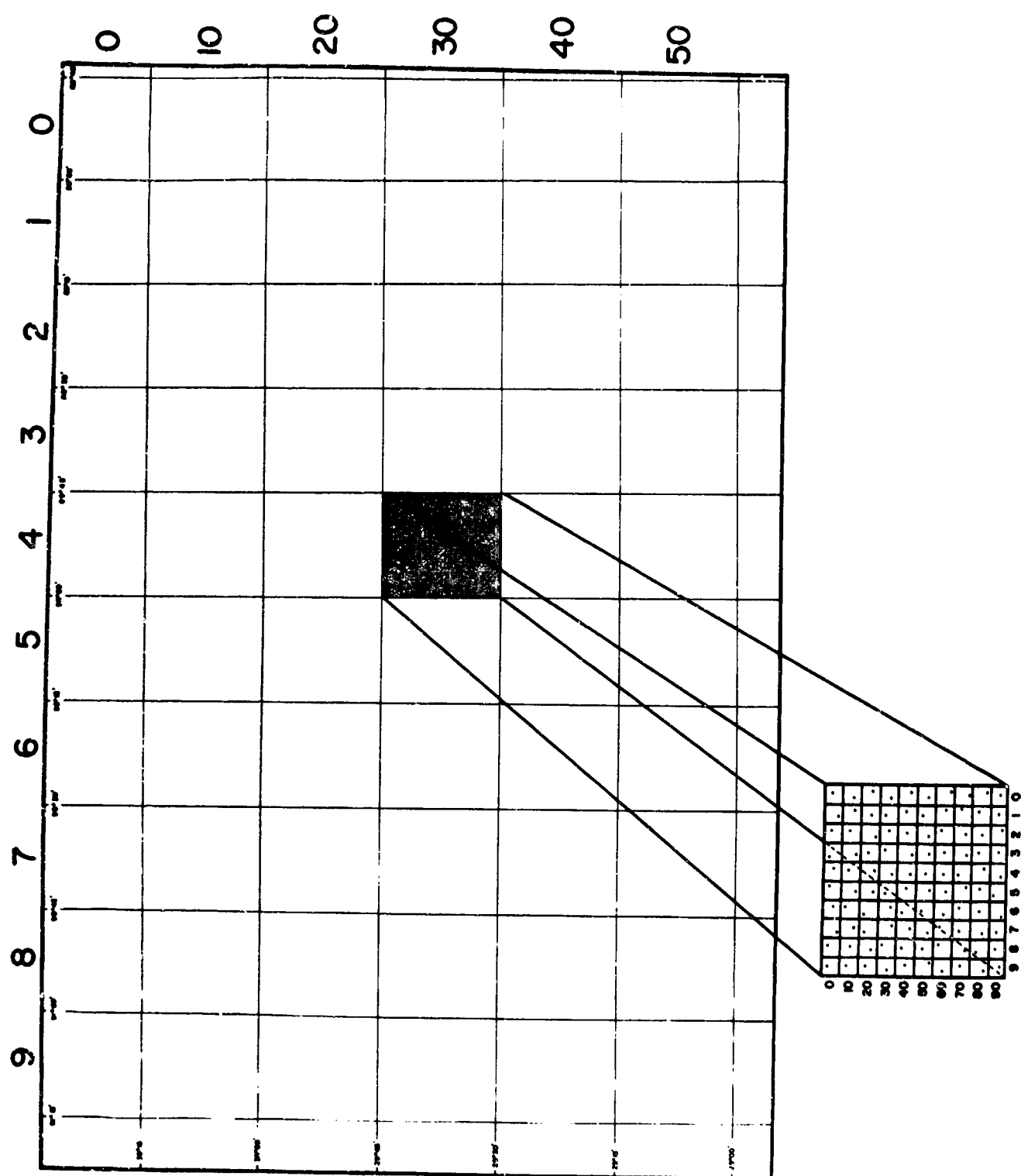


Figure 3. Principal component trends for major types of depositional environments of the Mississippi Delta region.

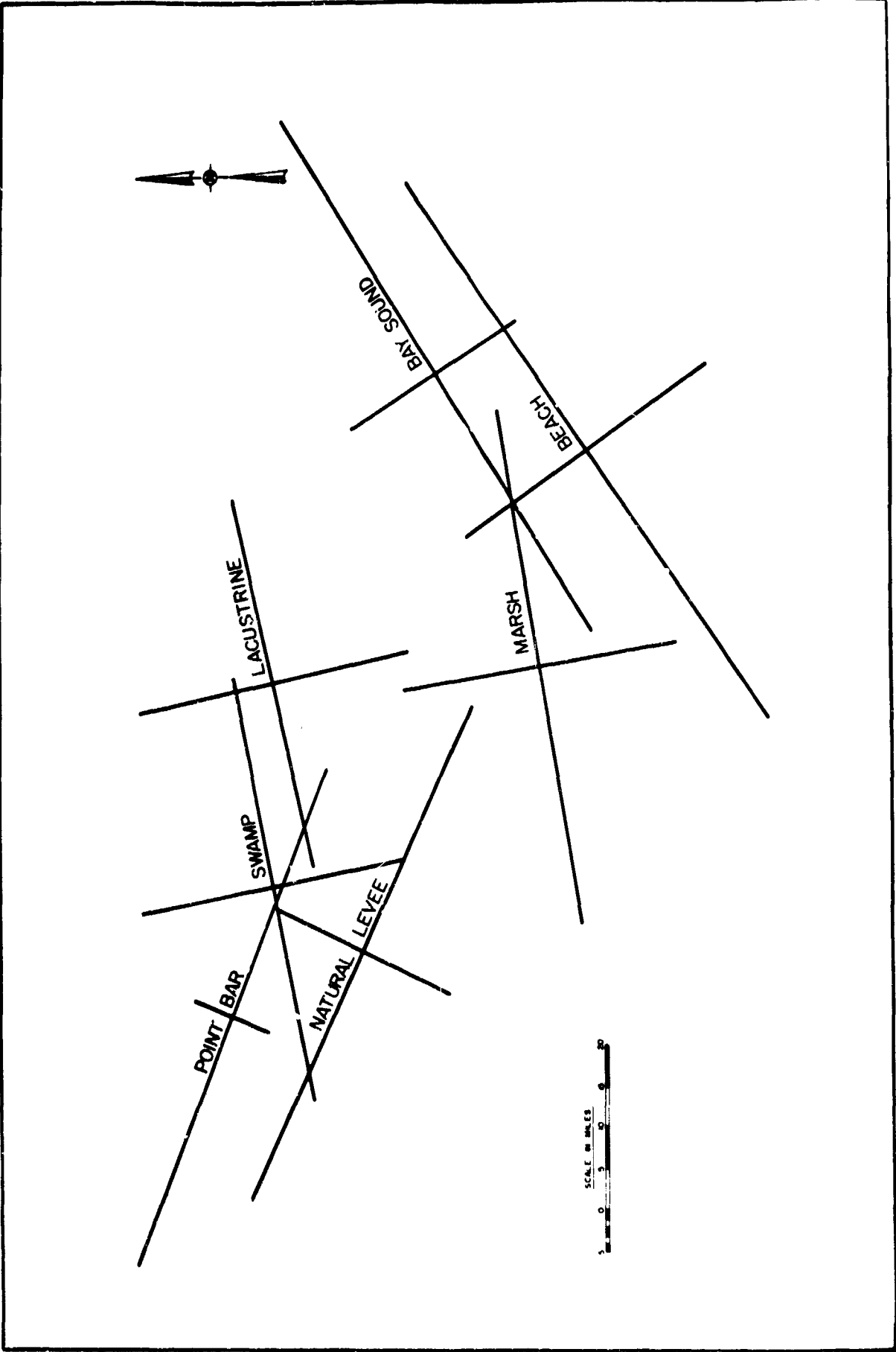


Figure 4. Dendrograph depicting mutual relationships among environment mean coordinate locations in the Mississippi Delta region.

DENDROGRAPH FOR ENVIRONMENTAL
PAIRWISE INTER-DISTANCE

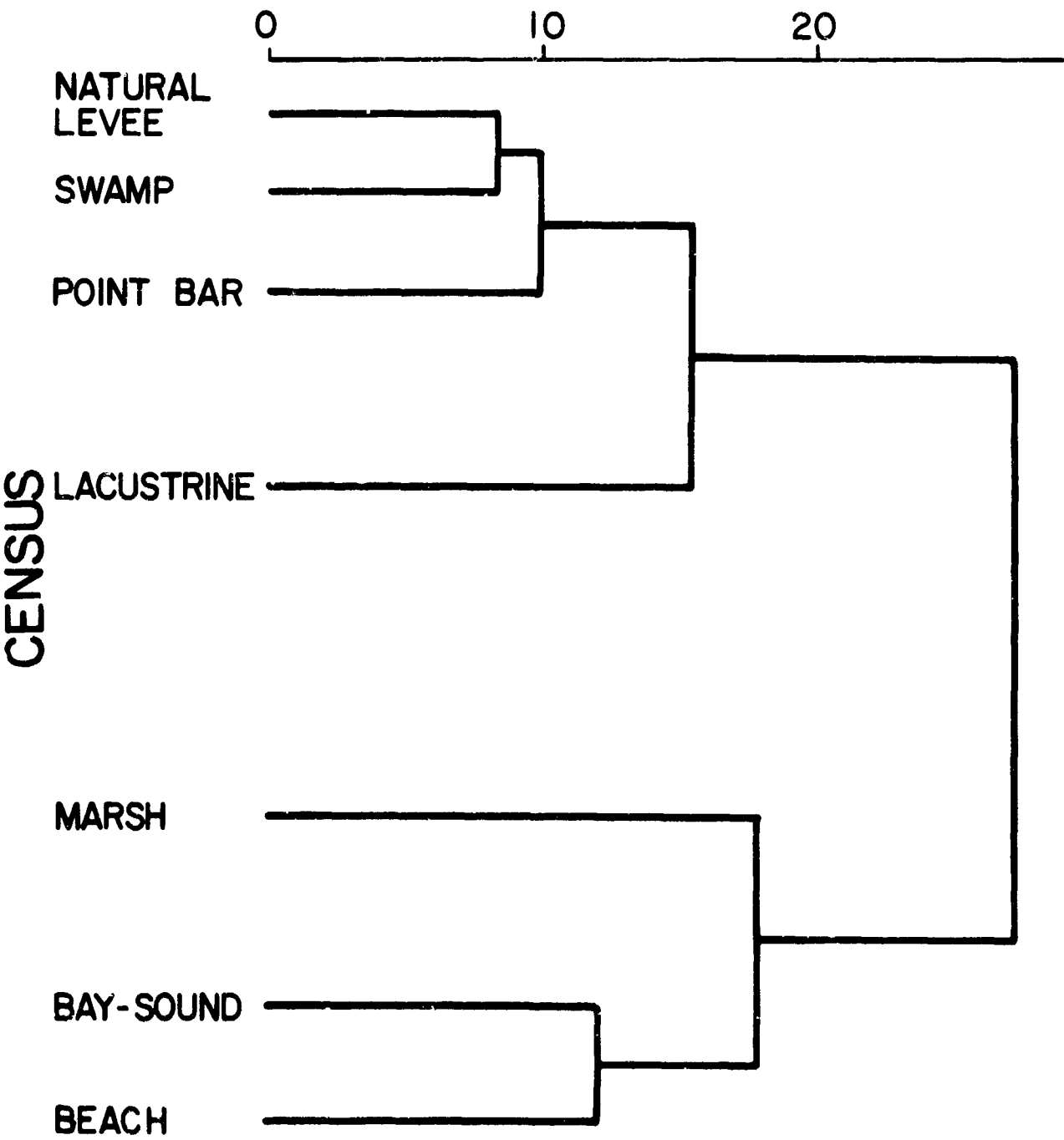


Figure 5. Dendrograph similar to Figure 4 based
on random sample of 500 data locations.

DENDROGRAPH FOR ENVIRONMENTAL PAIRWISE INTER-DISTANCE

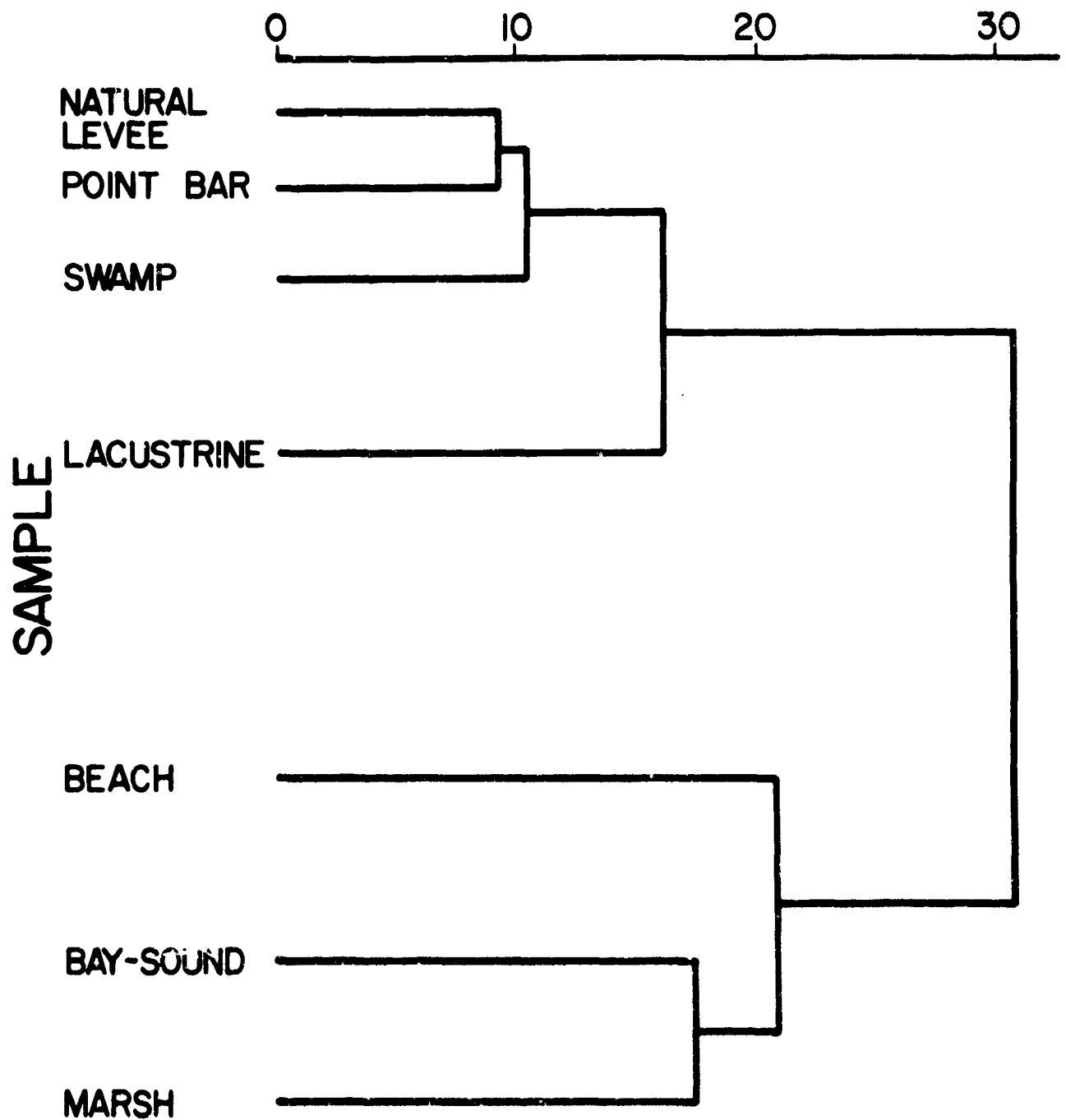


Figure 6. Proximal maps for Mississippi Delta region based on different size random samples. These computer drawn maps were generated using the SYMAP program [9]. In the following maps, the symbols represent: ■, natural levee; ', point bar; +, swamp; X, marsh; 0, beach; □, lacustrine; ., bay-sound.

a. Proximal map based on 5 random samples.

[illegible]

Figure 6b. Proximal map based on 10 random samples.

[illegible]

Figure 6c. Proximal map based on 20 random samples.

[illegible]

Figure 6d. Proximal map based on 50 random samples.

[illegible]

Figure 6e. Proximal map based on 100 random samples.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	5
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	---

Figure 6f. Proximal map based on 200 random samples.

[illegible]

Figure 6g. Proximal map based on 500 random samples.

[illegible]

Figure 7. Proximal maps similar to those in Figure 6 with the same numbers of samples based on systematic sampling. For each size sample n , every $[4025/n]$ sample location was chosen.

a. Proximal map based on 5 systematic samples.

[illegible]

Figure 7b. Proximal map based on 10 systematic samples.

[The page contains dense vertical black bars representing redacted or illegible text.]

[The bottom portion of the page shows faint horizontal lines and some scattered marks, possibly remnants of a signature or footer.]

Figure 7c. Proximal map based on 20 systematic samples.

[illegible]

Figure 7d. Proximal map based on 50 systematic samples.

[illegible]

Figure 7e. Proximal map based on 100 systematic samples.

[illegible]

Figure 7f. Proximal map based on 200 systematic samples.

[illegible]

Figure 7g. Proximal map based on 500 systematic samples.

[illegible]

Figure 8. Variation of $\bar{\lambda}_b$ for repeat sampling for different sample sizes. The numbers on the right in the figure are the average values obtained for different size samples for 100 repeat samplings.

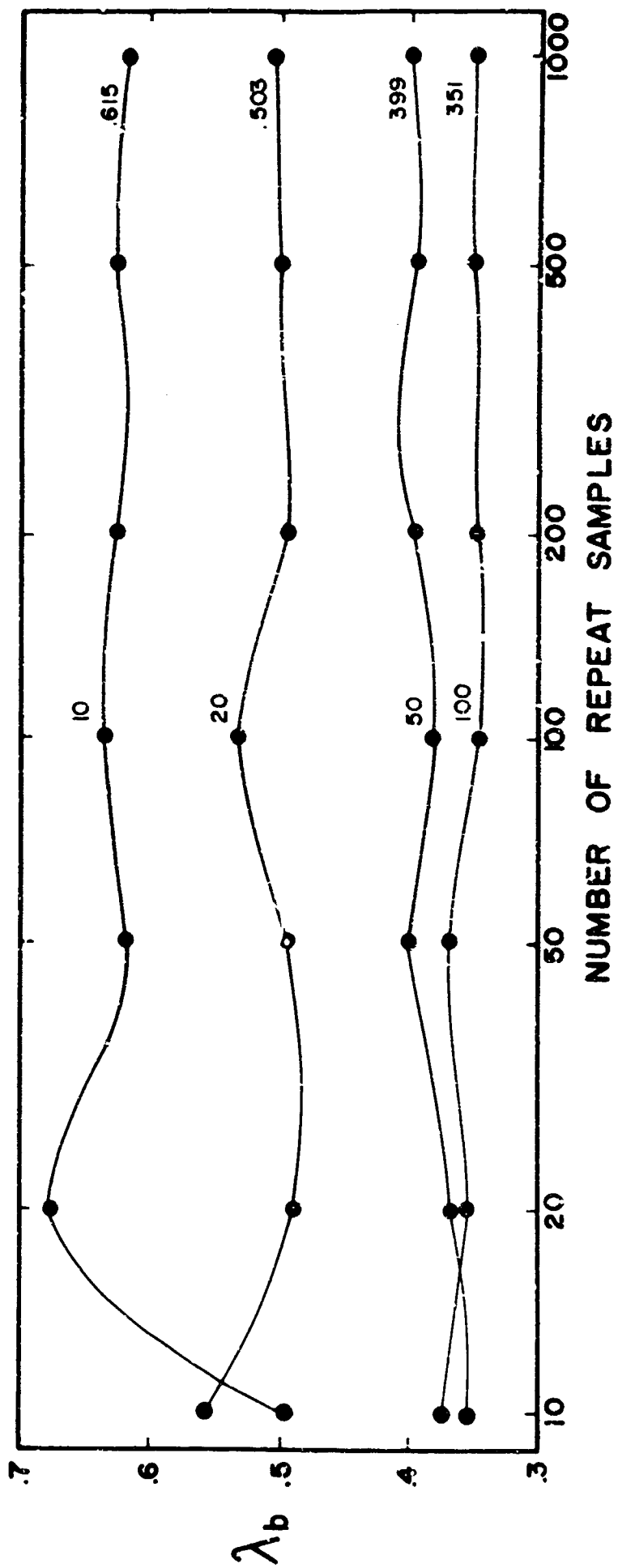
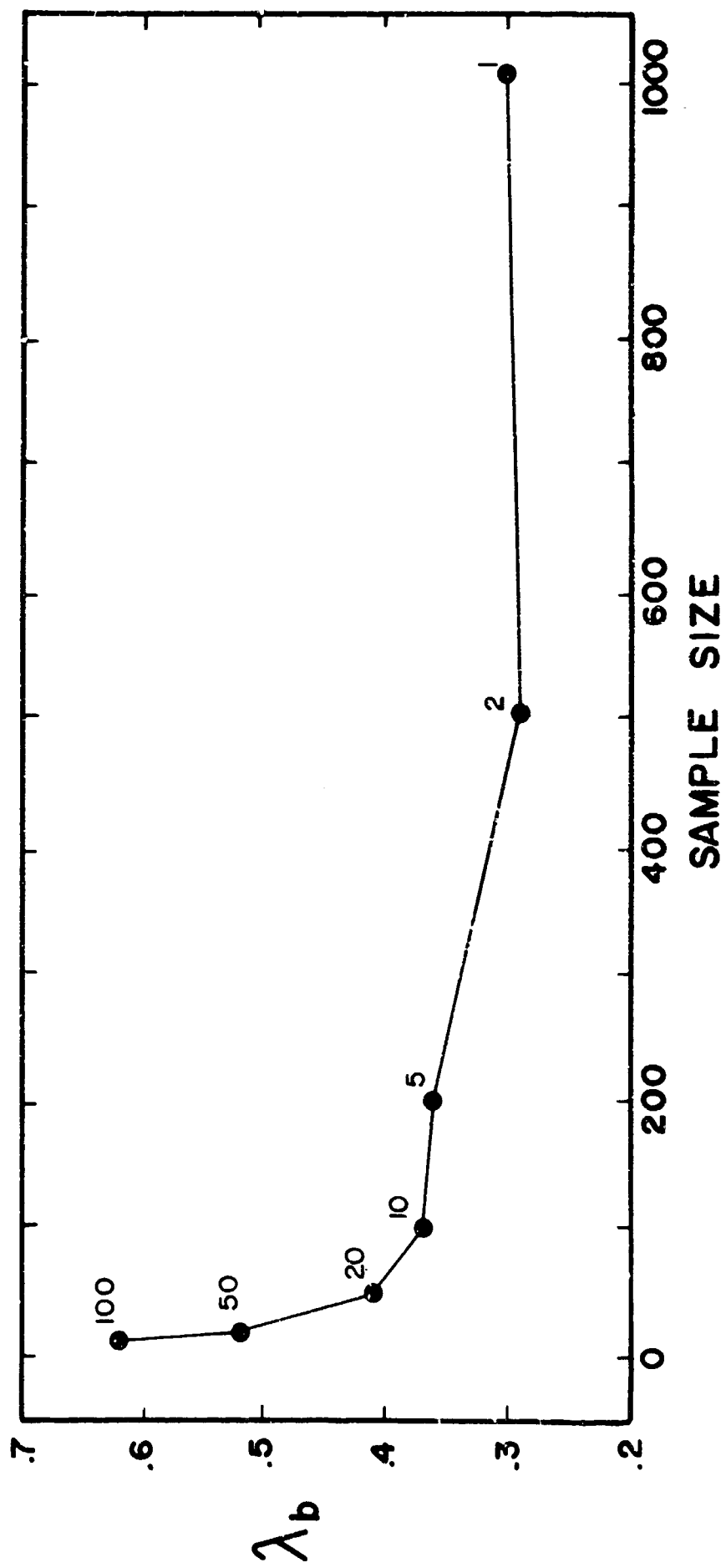


Figure 9. Variation of $\bar{\lambda}_b$ using product sampling rule as sample size increases. The different numbers of repeat sampling are shown in the figure.



Appendix. Mississippi Delta environmental sample.

The Appendix contains a tabulation of the number and types of environments recorded for each of 4025 areal units of observation from the grid overlay shown in Figure 2 which was used to sample the areal pattern given in Figure 1. In the column headings, B refers to the Block number and G refers to the Grid number used to locate each areal observation unit in Figure 2. E refers to the type environment recorded at the randomly located point within each unit of observation. EVS refers to the set of environments found within each areal unit. The environments are arranged in the following order: natural levee, point bar, swamp, marsh, beach, lacustrine, and bay-sound. The presence or absence of a type environment within an areal unit is indicated by the number one or zero, respectively.

MISSISSIPPI DELTA ENVIRONMENTAL SAMPLE

B G E EVS

0 89 7 0000001
0 98 7 0000001
1 38 3 0010000
1 72 7 0000001
1 75 7 0000001
1 78 7 0000001
1 81 7 0000001
1 84 7 0000001
1 87 7 0000001
1 90 7 0000001
1 93 7 0000001
1 96 7 0000001
1 99 7 0000001
2 52 7 0001001
2 55 4 0001000
2 64 7 0001001
2 80 7 0000001
2 83 7 0000001
2 91 7 0000001
2 94 7 0000001
3 27 3 0010000
3 35 3 0010000
3 38 3 0010000
3 46 3 0010000
3 49 3 0010000
3 57 3 0010000
3 65 3 0010000
3 68 3 0010000
3 77 3 0010000
3 86 3 0010000
3 96 3 0010000
4 23 3 0010000
4 64 3 0010000
4 73 3 0010000
4 89 6 0001010
4 94 4 0011000
4 98 4 0001010
5 21 3 0010000
5 34 3 0010000
5 37 4 0011000
5 41 3 0010000
5 47 3 0011010
5 53 6 0010010
5 56 6 0010010
5 59 6 0010010
5 63 6 0000010
5 66 6 0000010
5 69 6 0000010
5 72 6 0000010
5 75 6 0000010
5 78 6 0000010
5 81 6 0000010
5 84 6 0000010

B G E EVS

0 96 7 0000001
0 99 7 0000001
1 48 3 0011000
1 73 7 0000001
1 76 7 0000001
1 79 7 0000001
1 82 7 0000001
1 85 7 0000001
1 88 7 0000001
1 91 7 0000001
1 94 7 0000001
1 97 7 0000001
2 50 7 0001001
2 53 7 0001001
2 61 7 0001001
2 70 7 0000001
2 81 7 0000001
2 84 7 0000001
2 92 7 0000001
3 25 3 0010000
3 28 3 0010000
3 36 3 0010000
3 39 3 0010000
3 47 3 0010000
3 55 3 0010000
3 58 3 0010000
3 66 3 0010000
3 75 3 0010000
3 78 3 0010000
3 87 3 0010000
3 97 3 0010000
4 49 3 0010000
4 67 3 0010000
4 77 3 0010000
4 92 3 0010000
4 96 4 0001010
4 99 4 0001010
5 24 3 0010000
5 35 3 0011000
5 38 3 0011000
5 42 3 0010000
5 48 4 0011010
5 54 3 0010010
5 57 6 0000010
5 60 3 0010000
5 64 6 0000010
5 67 6 0000010
5 70 6 0011010
5 73 6 0000010
5 76 6 0000010
5 79 6 0000010
5 82 6 0000010
5 85 6 0000010

B G E EVS

0 97 7 0000001
1 29 3 0010000
1 69 4 0001000
1 74 7 0000001
1 77 7 0000001
1 80 7 0000001
1 83 7 0000001
1 86 7 0000001
1 89 7 0000001
1 92 7 0000001
1 95 7 0000001
1 98 7 0000001
2 51 4 0001001
2 54 4 0001001
2 62 7 0000001
2 72 7 0000001
2 82 7 0000001
2 90 7 0000001
2 93 7 0000001
3 26 3 0010000
3 29 3 0010000
3 37 3 0010000
3 45 3 0010000
3 48 3 0010000
3 56 3 0010000
3 59 3 0010000
3 67 3 0010000
3 76 3 0010000
3 85 3 0010000
3 95 3 0010000
4 20 3 0010000
4 55 3 0010000
4 71 3 0010000
4 87 3 0011000
4 93 3 0011000
4 97 4 0001010
5 20 3 0010000
5 31 3 0010000
5 36 3 0011000
5 39 3 0011000
5 46 4 0011010
5 49 3 0011000
5 55 6 0010010
5 58 6 0000010
5 62 6 0010010
5 65 6 0000010
5 68 6 0000010
5 71 6 0010010
5 74 6 0000010
5 77 6 0000010
5 80 6 0000010
5 83 6 0000010
5 86 6 0000010

B G E EVS

5 87 6 0000010
5 90 6 0000010
5 93 6 0000010
5 96 6 0000010
5 99 6 0000010
6 30 3 0010000
6 36 4 0011000
6 39 3 0010000
6 42 3 0010000
6 45 3 0011000
6 48 3 0010000
6 51 3 0010000
6 54 3 0010000
6 57 3 0010000
6 60 6 0010010
6 63 3 0010000
6 66 3 0010000
6 69 6 0010010
6 72 3 0010000
6 75 3 0010000
6 78 6 0000010
6 81 6 0010010
6 84 3 0010010
6 87 6 0010010
6 90 6 0000010
6 93 3 0010010
6 96 3 0011010
6 99 6 0000010
7 25 3 0010000
7 33 3 0010000
7 37 3 0010000
7 42 3 0010000
7 48 3 0010000
7 60 3 0010010
7 71 6 0010000
7 74 3 0010000
7 77 3 0010000
7 81 6 0000010
7 84 3 0010000
7 90 6 0000010
7 93 3 0010010
7 96 3 0010000
7 99 3 0010000
8 20 3 0010000
8 33 3 0010000
8 42 3 0010000
8 51 3 0010000
8 67 3 0010000
8 72 3 0010000
8 81 3 0010000
8 91 3 0010000
9 18 1 1000000
9 28 1 1100000
9 39 1 1000000

B G E EVS

5 88 6 0000010
5 91 6 0000010
5 94 6 0000010
5 97 6 0000010
6 20 3 0010000
6 33 3 0010000
6 37 3 0010000
6 40 3 0010000
6 43 3 0010000
6 46 3 0010000
6 49 3 0010000
6 52 3 0010000
6 55 3 0010000
6 58 3 0010000
6 61 3 0010010
6 64 3 0010000
6 67 3 0010010
6 70 6 0000010
6 73 3 0010010
6 76 3 0010010
6 79 6 0000010
6 82 3 0010010
6 85 3 0010010
6 88 6 0000010
6 91 6 0000010
6 94 3 0010000
6 97 5 0000010
7 13 3 0010000
7 30 3 0010000
7 34 3 0010000
7 40 3 0010000
7 45 3 0010000
7 50 3 0010000
7 61 3 0010000
7 72 3 0010010
7 75 3 0010000
7 78 3 0010000
7 82 6 0010010
7 88 3 0010000
7 91 6 0000010
7 94 3 0010000
7 97 3 0010000
8 13 3 0010000
8 21 3 0010000
8 36 3 0010000
8 44 3 0010000
8 52 3 0010000
8 68 3 0010000
8 73 3 0010000
8 82 3 0010000
8 92 3 0010000
9 19 1 1000000
9 29 1 1000000
9 46 1 1000000

B G E EVS

5 89 6 0000010
5 92 6 0000010
5 95 6 0000010
5 98 6 0000010
6 24 3 0010000
6 34 3 0011000
6 38 3 0010000
6 41 3 0010000
6 44 3 0011000
6 47 3 0010000
6 50 3 0010000
6 53 3 0010000
6 56 3 0010000
6 59 3 0010000
6 62 3 0010000
6 65 3 0010000
6 68 3 0010010
6 71 6 0010010
6 74 3 0010000
6 77 6 0010010
6 80 6 0000010
6 83 3 0010010
6 86 6 0010010
6 89 6 0000010
6 92 6 0000010
6 95 3 0011000
6 98 6 0000010
7 21 3 0010000
7 31 3 0010000
7 36 3 0010000
7 41 3 0010000
7 46 3 0010000
7 51 3 0010000
7 70 6 0000010
7 73 3 0010000
7 76 3 0010000
7 80 6 0000010
7 83 3 0010010
7 89 3 0010000
7 92 6 0000010
7 95 3 0010000
7 98 3 0010000
8 15 3 0010000
8 26 3 0010000
8 41 3 0010000
8 45 3 0010000
8 64 3 0010000
8 69 3 0010000
8 80 3 0010000
8 83 3 0010000
8 93 3 0010000
9 27 1 1000000
9 38 2 1100000
9 47 2 1100000

B	G	E	EVS
9	48	2	1100000
9	56	1	1000000
9	59	2	1100000
9	64	1	1000000
9	67	2	1100000
9	70	3	1010000
9	73	1	1010000
9	76	1	1100000
9	79	1	1100000
9	82	3	0010000
9	85	1	1000000
9	88	2	1100000
9	91	3	1010000
9	94	1	1100000
9	97	1	1010000
10	5	7	0001101
10	8	7	0000001
10	18	4	0001101
10	69	7	0000001
10	77	7	0000001
10	84	7	0001101
10	87	7	0000001
10	94	7	0000001
10	97	7	0000001
11	0	7	0000001
11	3	7	0001101
11	6	7	0000101
11	9	7	0000001
11	12	7	0000001
11	15	7	0000001
11	18	7	0000001
11	21	7	0000001
11	24	7	0000101
11	27	7	0000001
11	31	7	0000001
11	34	7	0000001
11	37	4	0001001
11	40	7	0000001
11	43	7	0000001
11	46	7	0000001
11	49	7	0001001
11	52	7	0000001
11	55	7	0000001
11	58	7	0001001
11	61	7	0000001
11	64	7	0000001
11	67	7	0000001
11	70	7	0000001
11	73	7	0000001
11	76	7	0001001
11	79	4	0001010
11	82	7	0000001
11	85	7	0000001
11	88	4	0001001

B	G	E	EVS
9	49	1	1100000
9	57	2	1100000
9	60	3	0010000
9	65	1	1000000
9	68	2	1100000
9	71	1	1010000
9	74	1	1000000
9	77	1	1100000
9	80	1	1010000
9	83	3	1010000
9	86	1	1100000
9	89	1	1100000
9	92	1	1010000
9	95	2	1100000
9	98	1	1000000
10	6	7	0000001
10	9	7	0000001
10	19	7	0000101
10	75	7	0001101
10	78	7	0000001
10	85	7	0000001
10	88	7	0000001
10	95	7	0000001
10	98	7	0000001
11	1	7	0000001
11	4	5	0001101
11	7	7	0000001
11	10	7	0000001
11	13	5	0001101
11	16	7	0000001
11	19	7	0000001
11	22	7	0000001
11	25	7	0000001
11	28	7	0000001
11	32	7	0000001
11	35	7	0000001
11	38	7	0001001
11	41	7	0000001
11	44	7	0000001
11	47	7	0001001
11	50	7	0000001
11	53	7	0000001
11	56	7	0000001
11	59	4	0001001
11	62	7	0000001
11	65	7	0000001
11	68	7	0001001
11	71	7	0000001
11	74	7	0000001
11	77	4	0001001
11	80	7	0000001
11	83	7	0000001
11	86	7	0001001
11	89	6	0001010

B	G	E	EVS
9	55	1	1000000
9	58	2	0100000
9	63	3	1010000
9	66	2	1100000
9	69	1	1100000
9	72	3	1010000
9	75	1	1000000
9	78	1	1100000
9	81	3	0010000
9	84	1	1000000
9	87	2	1100000
9	90	1	1010000
9	93	1	1010000
9	96	1	1100000
9	99	1	1000000
10	7	7	0000001
10	16	5	0001101
10	59	7	0000001
10	76	7	0000001
10	79	7	0000001
10	86	7	0000001
10	89	7	0000001
10	96	7	0000001
10	99	7	0000001
11	2	7	0000101
11	5	7	0001101
11	8	7	0000001
11	11	7	0000001
11	14	4	0001101
11	17	7	0000001
11	20	7	0000001
11	23	7	0000101
11	26	7	0000001
11	29	7	0000001
11	32	7	0000001
11	36	7	0001001
11	39	7	0000001
11	42	7	0000001
11	45	7	0000001
11	48	7	0001001
11	51	7	0000001
11	54	7	0000001
11	57	7	0000001
11	60	7	0000001
11	63	7	0000001
11	66	7	0000001
11	69	4	0001000
11	72	7	0000001
11	75	7	0000001
11	78	4	0001001
11	81	7	0000001
11	84	7	0000001
11	87	7	0001001
11	90	7	0000001

B	G	E	EVS
11	91	7	0000001
11	94	7	0000001
11	97	7	0000001
12	0	7	0000001
12	3	7	0000001
12	6	7	0001101
12	11	7	0000001
12	14	7	0000001
12	17	7	0001101
12	20	7	0000001
12	23	7	0000001
12	26	7	0000001
12	29	4	0001001
12	32	7	0000001
12	35	7	0000001
12	36	7	0001001
12	41	7	0000001
12	44	7	0000001
12	47	4	0001001
12	50	7	0001001
12	53	7	0000001
12	56	7	0000001
12	59	7	0000001
12	62	7	0001001
12	65	7	0000001
12	68	7	0001001
12	71	4	0001010
12	74	7	0001011
12	77	7	0001001
12	80	6	0001010
12	83	4	0001010
12	86	4	0001011
12	89	4	0001001
12	92	6	0001010
12	95	6	0001010
12	98	4	0001010
13	1	3	0010000
13	10	4	0001100
13	14	3	0011000
13	17	3	0010000
13	20	4	0001101
13	23	4	0011010
13	26	3	0011000
13	29	4	0011000
13	32	7	0001001
13	35	4	0001011
13	38	4	0001010
13	41	7	0000001
13	44	7	0000001
13	47	4	0001010
13	50	7	0000001
13	53	7	0000001
13	56	4	0001001
13	59	4	0001010

B	G	E	EVS
11	92	7	0000001
11	95	7	0000001
11	98	7	0001011
12	1	7	0000001
12	4	7	0000001
12	7	4	0001100
12	12	7	0000001
12	15	7	0000001
12	18	4	0001100
12	21	7	0000001
12	24	7	0000001
12	27	7	0001001
12	30	7	0000001
12	33	7	0000001
12	36	7	0000001
12	39	7	0000001
12	42	7	0000001
12	45	7	0000001
12	48	7	0000001
12	51	7	0001001
12	54	7	0000001
12	57	7	0000001
12	60	4	0001001
12	63	7	0000001
12	66	7	0000001
12	69	7	0001001
12	72	6	0001011
12	75	7	0001011
12	78	4	0001001
12	81	6	0001010
12	84	6	0001010
12	87	4	0001011
12	90	6	0001010
12	93	6	0001010
12	96	6	0001010
12	99	4	0001000
13	7	3	0010000
13	11	4	0001100
13	15	3	0010000
13	18	3	0010000
13	21	4	0001111
13	24	4	0011010
13	27	3	0011000
13	30	7	0000001
13	33	4	0001011
13	36	6	0001010
13	39	4	0001010
13	42	7	0000001
13	45	7	0001001
13	48	6	0001010
13	51	7	0000001
13	54	7	0000001
13	57	4	0001001
13	60	7	0000001

B	G	E	EVS
11	93	7	0000001
11	96	7	0000001
11	99	6	0001010
12	2	7	0000001
12	5	7	0000001
12	10	7	0000001
12	13	7	0000001
12	16	7	0000001
12	19	5	0001100
12	22	7	0000001
12	25	7	0000001
12	28	7	0001001
12	31	7	0000001
12	34	7	0000001
12	37	7	0001001
12	40	7	0000001
12	43	7	0000001
12	46	7	0001001
12	49	7	0000001
12	52	7	0000001
12	55	7	0000001
12	58	7	0000001
12	61	4	0001001
12	64	7	0000001
12	67	7	0000001
12	70	6	0001010
12	73	4	0001011
12	76	7	0001001
12	79	4	0001001
12	82	6	0001010
12	85	4	0001010
12	88	4	0001001
12	91	6	0001010
12	94	6	0001010
12	97	6	0001010
13	5	3	0010000
13	9	3	0010000
13	13	4	0011000
13	16	3	0010000
13	19	3	0010000
13	22	4	0001011
13	25	4	0011000
13	28	4	0011000
13	31	7	0000001
13	34	4	0001011
13	37	4	0001010
13	40	7	0000001
13	43	7	0001001
13	46	6	0001011
13	49	6	0001010
13	52	7	0000001
13	55	7	0000001
13	58	4	0001010
13	61	7	0000001

B	G	E	EVS
13	62	7	00000001
13	65	7	00000001
13	68	4	00010000
13	71	7	00000001
13	74	7	00000001
13	77	7	00010111
13	80	7	00010001
13	83	7	00000001
13	86	7	00000111
13	89	4	00010100
13	92	7	00010001
13	95	6	00000111
13	98	6	00010100
14	2	3	00110000
14	5	6	00010100
14	8	6	00000100
14	11	4	00110100
14	14	6	00010100
14	17	6	00000100
14	20	4	00010100
14	23	6	00000100
14	26	6	00000100
14	29	6	00000100
14	32	6	00000100
14	35	6	00000100
14	38	6	00000100
14	41	6	00000100
14	44	4	00010100
14	47	6	00000100
14	50	1	10010100
14	53	6	00010100
14	56	6	00010100
14	59	6	00000100
14	62	4	00010100
14	65	4	00010000
14	68	6	00000100
14	71	4	00010100
14	74	1	10010000
14	77	4	00110000
14	80	6	00010100
14	83	4	00010100
14	86	1	10010000
14	89	3	00100010
14	92	6	00000100
14	95	4	00010000
14	98	3	10110000
15	1	6	00000100
15	4	6	00000100
15	7	6	00000100
15	10	6	00000100
15	13	6	00000100
15	16	6	00000100
15	19	6	00000100
15	22	6	00000100

B	G	E	EVS
13	63	7	00000001
13	66	7	00000001
13	69	4	00010100
13	72	7	00000001
13	75	7	00000001
13	78	6	00010100
13	81	7	00000001
13	84	7	00000001
13	87	6	00000111
13	90	4	00010001
13	93	7	00000001
13	96	6	00000100
13	99	6	00010100
14	3	4	00110000
14	6	6	00010100
14	9	6	00000100
14	12	4	00010100
14	15	6	00000100
14	18	6	00000100
14	21	6	00010100
14	24	6	00000100
14	27	6	00000100
14	30	6	00000100
14	33	6	00000100
14	36	6	00000100
14	39	6	00000100
14	42	6	00000100
14	45	4	00010100
14	48	6	00000100
14	51	6	00010100
14	54	6	10010100
14	57	6	00000100
14	60	4	10010100
14	63	4	10010000
14	66	4	00010100
14	69	6	00000100
14	72	4	10010100
14	75	4	10010000
14	78	3	00100010
14	81	4	00010100
14	84	4	00010000
14	87	3	00110000
14	90	6	00000100
14	93	6	00010100
14	96	4	00010100
14	99	3	10110000
15	2	6	00000100
15	5	6	00000100
15	8	6	00000100
15	11	6	00000100
15	14	6	00000100
15	17	6	00000100
15	20	6	00000100
15	23	6	00000100

B	G	E	EVS
13	64	7	00000001
13	67	4	00010001
13	70	7	00000001
13	73	7	00000001
13	76	7	00000001
13	79	4	00010100
13	82	7	00000001
13	85	7	00000001
13	88	6	00010100
13	91	7	00010001
13	94	6	00000111
13	97	6	00000100
14	1	3	00110000
14	4	4	00010100
14	7	6	00010100
14	10	3	00110000
14	13	6	00010100
14	16	6	00000100
14	19	6	00000100
14	22	6	00000100
14	25	6	00000100
14	28	6	00000100
14	31	6	00000100
14	34	6	00010100
14	37	6	00000100
14	40	4	00010100
14	43	6	00000100
14	46	6	00000100
14	49	6	00000100
14	52	6	00000100
14	55	4	00010000
14	58	6	00000100
14	61	4	10010100
14	64	4	10010000
14	67	4	00010100
14	70	4	00010000
14	73	4	10010000
14	76	4	00010000
14	79	6	00100010
14	82	6	00010100
14	85	4	10010000
14	88	3	00100000
14	91	6	00000100
14	94	4	00010100
14	97	1	10110000
15	0	6	00000100
15	3	6	00000100
15	6	6	00000100
15	9	6	00000100
15	12	6	00000100
15	15	6	00000100
15	18	6	00000100
15	21	6	00000100
15	24	6	00000100

B	G	E	EVS
15	25	6	0000010
15	28	6	0000010
15	31	6	0000010
15	34	6	0000010
15	37	6	0000010
15	40	6	0000010
15	43	6	0000010
15	46	6	0000010
15	49	6	0000010
15	52	6	0000010
15	55	6	0000010
15	58	6	0000010
15	61	6	0000010
15	64	5	0000010
15	67	6	0000010
15	70	6	0000010
15	73	6	0000010
15	76	6	0000010
15	79	6	0000010
15	82	6	0000010
15	85	6	0000010
15	88	6	0000010
15	91	3	0000010
15	94	3	0000010
15	97	4	0000010
16	0	6	0000010
16	3	6	0000010
16	6	4	0000010
16	9	6	0000010
16	12	6	0000010
16	15	6	0000010
16	18	6	0000010
16	21	6	0000010
16	24	6	0000010
16	27	3	0000010
16	30	6	0000010
16	33	6	0000010
16	36	6	0000010
16	39	4	0000010
16	42	6	0000010
16	45	6	0000010
16	48	3	0000010
16	51	6	0000010
16	54	6	0000010
16	57	3	0000010
16	60	6	0000010
16	63	6	0000010
16	66	3	0000010
16	69	2	0000010
16	72	6	0000010
16	75	3	0000010
16	78	1	0000010
16	81	3	0000010
16	84	4	0000010

B	G	E	EVS
15	26	6	0000010
15	29	6	0000010
15	32	6	0000010
15	35	6	0000010
15	38	6	0000010
15	41	6	0000010
15	44	6	0000010
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15	59	6	0000010
15	62	6	0000010
15	65	5	0000010
15	68	6	0000010
15	71	6	0000010
15	74	6	0000010
15	77	6	0000010
15	80	3	0000010
15	83	6	0000010
15	86	6	0000010
15	89	4	0000010
15	92	3	0000010
15	95	3	0000010
15	98	3	0000010
16	1	6	0000010
16	4	6	0000010
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16	10	6	0000010
16	13	6	0000010
16	16	4	0000010
16	19	6	0000010
16	22	6	0000010
16	25	6	0000010
16	28	3	0000010
16	31	6	0000010
16	34	6	0000010
16	37	4	0000010
16	40	6	0000010
16	43	6	0000010
16	46	6	0000010
16	49	3	0000010
16	52	6	0000010
16	55	6	0000010
16	58	3	0000010
16	61	6	0000010
16	64	6	0000010
16	67	3	0000010
16	70	6	0000010
16	73	6	0000010
16	76	3	0000010
16	79	2	0000010
16	82	4	0000010
16	85	3	0000010

B	G	E	EVS
15	27	6	0000010
15	30	6	0000010
15	33	6	0000010
15	36	5	0000010
15	39	6	0000010
15	42	6	0000010
15	45	6	0000010
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15	54	6	0000010
15	57	6	0000010
15	60	6	0000010
15	63	6	0000010
15	66	6	0000010
15	69	6	0000010
15	72	6	0000010
15	75	6	0000010
15	78	6	0000010
15	81	3	0000010
15	84	6	0000010
15	87	6	0000010
15	90	3	0000010
15	93	3	0000010
15	96	3	0000010
15	99	3	0000010
16	2	6	0000010
16	5	3	0000010
16	8	6	0000010
16	11	6	0000010
16	14	6	0000010
16	17	4	0000010
16	20	6	0000010
16	23	6	0000010
16	26	4	0000010
16	29	6	0000010
16	32	6	0000010
16	35	6	0000010
16	38	3	0000010
16	41	6	0000010
16	44	6	0000010
16	47	3	0000010
16	50	6	0000010
16	53	6	0000010
16	56	6	0000010
16	59	3	0000010
16	62	6	0000010
16	65	6	0000010
16	68	3	0000010
16	71	6	0000010
16	74	6	0000010
16	77	3	0000010
16	80	3	0000010
16	83	4	0000010
16	86	3	0000010

B	G	E	EVS
16	87	1	1010000
16	90	3	0011000
16	93	4	0011000
16	96	1	1010000
16	99	1	1100000
17	2	5	0010010
17	5	3	0010000
17	8	3	0010000
17	11	6	0000010
17	14	3	0010010
17	17	3	0010000
17	20	6	0000010
17	23	3	0010010
17	26	3	0010000
17	29	3	0010000
17	32	3	0011010
17	35	3	0010000
17	38	3	0010000
17	41	3	0010010
17	44	3	0010000
17	47	3	0010000
17	50	3	0110000
17	53	3	0010000
17	56	3	0010000
17	59	3	0010000
17	62	3	0010000
17	65	3	1010000
17	68	3	0010000
17	71	2	0100000
17	74	1	1000000
17	77	1	1010000
17	80	1	1100000
17	83	1	1000000
17	86	1	1000000
17	89	1	1000000
17	92	2	1010000
17	95	1	1000000
17	98	1	1000000
18	1	3	0010000
18	9	3	0010000
18	12	3	0010000
18	21	3	0010000
18	28	1	1000000
18	31	3	0010000
18	36	1	1000000
18	39	1	1000000
18	42	3	0010000
18	45	1	1000000
18	48	1	1100000
18	51	3	0010000
18	54	1	1010000
18	57	1	1100000
18	60	3	0010000
18	63	1	1010000

B	G	E	EVS
16	88	1	1100000
16	91	3	0010000
16	94	3	0010000
16	97	1	1100000
17	0	6	0000010
17	3	3	0010010
17	6	3	0010000
17	9	3	0010000
17	12	6	0010010
17	15	3	0010000
17	18	3	0010000
17	21	6	0000010
17	24	3	0010000
17	27	3	0010000
17	30	4	0011010
17	33	3	0010000
17	36	3	0010000
17	39	3	0010000
17	42	3	0010000
17	45	3	0010000
17	48	3	0010000
17	51	3	0010000
17	54	3	0010000
17	57	3	0010000
17	60	2	0100000
17	63	3	1010000
17	66	3	1010000
17	69	3	0010000
17	72	2	1100000
17	75	1	1000000
17	78	1	1010000
17	81	2	1100000
17	84	1	1000000
17	87	1	1000000
17	90	1	1000000
17	93	1	1010000
17	96	1	1000000
17	99	1	1100000
18	2	3	0010000
18	10	3	0010000
18	13	3	0010000
18	22	3	0010000
18	29	1	1000000
18	32	3	0010000
18	37	1	1000000
18	40	3	0010000
18	43	3	0010000
18	46	1	1000000
18	49	1	1100000
18	52	3	0010000
18	55	1	1000000
18	58	2	1100000
18	61	3	0010000
18	64	1	1000000

B	G	E	EVS
16	89	1	1100000
16	92	4	0011000
16	95	3	1010000
16	98	1	1100000
17	1	6	0000010
17	4	3	0010000
17	7	3	0010000
17	10	6	0000010
17	13	6	0010010
17	16	3	0010000
17	19	3	0010000
17	22	6	0000010
17	25	3	0010000
17	28	3	0010000
17	31	3	0011010
17	34	3	0010000
17	37	2	0010000
17	40	3	0010010
17	43	3	0010000
17	46	3	0010000
17	49	3	0010000
17	52	3	0010000
17	55	3	0010000
17	58	3	0010000
17	61	2	0110000
17	64	3	1010000
17	67	3	0010000
17	70	2	0100000
17	73	1	1000000
17	76	1	1000000
17	79	3	1010000
17	82	1	1100000
17	85	1	1000000
17	88	1	1000000
17	91	1	1000000
17	94	1	1000000
17	97	1	1000000
18	0	3	0010000
18	6	3	0010000
18	11	3	0010000
18	20	3	0010000
18	23	3	0010000
18	30	3	0010000
18	33	3	0010000
18	38	1	1000000
18	41	3	0010000
18	44	1	1010000
18	47	2	1100000
18	50	3	0010000
18	53	3	1010000
18	56	1	1100000
18	59	1	1100000
18	62	3	1010000
18	65	1	1100000

B	G	E	EVS
18 66	1	1100000	
18 69	1	1000000	
18 72	1	1010000	
18 75	1	1100000	
18 78	1	1000000	
18 81	1	1010000	
18 84	2	1100000	
18 87	3	1010000	
18 90	2	1100000	
18 93	1	1000000	
18 96	3	0010000	
18 99	1	1010000	
19 2	1	1000000	
19 5	2	1100000	
19 8	1	1000000	
19 11	2	1100000	
19 14	1	1100000	
19 17	1	1000000	
19 20	1	1100000	
19 23	1	1100000	
19 26	1	1100000	
19 29	1	1000000	
19 32	1	1000000	
19 35	1	1000000	
19 38	1	1000000	
19 41	1	1100000	
19 44	1	1000000	
19 47	1	1000000	
19 50	1	1100000	
19 53	1	1000000	
19 56	1	1000000	
19 59	3	1010000	
19 62	1	1000000	
19 65	1	1000000	
19 68	1	1000000	
19 71	1	1000000	
19 74	1	1000000	
19 77	3	0010000	
19 80	1	1000000	
19 83	1	1000000	
19 86	1	1010000	
19 89	3	0010000	
19 92	1	1000000	
19 95	1	1000000	
19 98	3	0010000	
20 4	7	0000001	
20 7	7	0000001	
20 12	7	0010001	
20 15	7	0000001	
20 18	7	0000001	
20 24	7	0000001	
20 27	7	0000001	
20 33	7	0010001	
20 36	7	0000001	

B	G	E	EVS
18 67	1	1000000	
18 70	3	1010000	
18 73	1	1000000	
18 76	1	1000000	
18 79	1	1000000	
18 82	1	1110000	
18 85	1	1000000	
18 88	3	1010000	
18 91	2	1100000	
18 94	1	1100000	
18 97	3	0010000	
19 0	1	1010000	
19 3	1	1000000	
19 6	1	1100000	
19 9	1	1000000	
19 12	1	1100000	
19 15	2	1100000	
19 18	1	1000000	
19 21	2	1100000	
19 24	1	1100000	
19 27	1	1000000	
19 30	2	1100000	
19 33	1	1000000	
19 36	1	1000000	
19 39	1	1000000	
19 42	1	1000000	
19 45	1	1000000	
19 48	1	1010000	
19 51	1	1100000	
19 54	1	1000000	
19 57	1	1000000	
19 60	1	1000000	
19 63	1	1000000	
19 66	1	1010000	
19 69	3	1010000	
19 72	1	1000000	
19 75	1	1000000	
19 78	3	1010000	
19 81	1	1000000	
19 84	1	1000000	
19 87	3	1010000	
19 90	1	1010000	
19 93	1	1000000	
19 96	1	1010000	
19 99	3	0010000	
20 5	7	0000001	
20 8	7	0000001	
20 13	7	0010001	
20 16	7	0000001	
20 19	7	0000001	
20 25	7	0000001	
20 28	7	0000001	
20 34	7	0000001	
20 37	7	0000001	

B	G	E	EVS
18 68	1	1000000	
18 71	3	1010000	
18 74	1	1100000	
18 77	1	1000000	
18 80	1	1000000	
18 83	1	1100000	
18 86	1	1010000	
18 89	1	1010000	
18 92	2	0100000	
18 95	3	1010000	
18 98	3	1010000	
19 1	1	1000000	
19 4	1	1100000	
19 7	1	1000000	
19 10	1	1000000	
19 13	2	1100000	
19 16	1	1100000	
19 19	1	1000000	
19 22	1	1100000	
19 25	2	1100000	
19 28	1	1000000	
19 31	2	1100000	
19 34	1	1000000	
19 37	1	1000000	
19 40	2	1100000	
19 43	1	1000000	
19 46	1	1000000	
19 49	3	1010000	
19 52	1	1000000	
19 55	1	1000000	
19 58	1	1000000	
19 61	1	1000000	
19 64	1	1000000	
19 67	1	1010000	
19 70	1	1000000	
19 73	1	1000000	
19 76	1	1010000	
19 79	3	0010000	
19 82	1	1000000	
19 85	1	1000000	
19 88	3	0010000	
19 91	1	1000000	
19 94	1	1000000	
19 97	1	1010000	
20 3	7	0010101	
20 6	7	0000001	
20 9	7	0000001	
20 14	7	0000001	
20 17	7	0000001	
20 23	7	0010001	
20 26	7	0000001	
20 29	7	0000001	
20 35	7	0000001	
20 38	7	0000001	

B	G	E	EVS
20	39	7	CCCC001
20	45	7	CG10001
20	48	7	0000001
20	54	7	CC1C001
20	57	7	0010001
20	63	3	0010101
20	66	7	0000001
20	69	7	0010001
20	75	7	CC00C01
20	78	7	0000001
20	85	7	0000001
20	88	7	0000001
20	95	7	0000001
20	98	7	CCCCC01
21	1	7	0000001
21	4	7	0000001
21	7	7	CCCC001
21	10	7	0000001
21	13	7	0000001
21	16	7	0000001
21	19	4	0001001
21	22	7	00CC001
21	25	7	00CC001
21	28	7	00C0001
21	32	7	0CCC001
21	35	7	0000001
21	38	7	0000001
21	41	7	0000001
21	44	7	0000001
21	47	7	CCCC001
21	50	7	0000001
21	53	7	0000001
21	56	7	CC0C001
21	59	7	0000001
21	62	7	0000001
21	65	7	0000001
21	68	7	0000001
21	71	7	00CC001
21	74	7	0000001
21	77	7	0000001
21	80	7	0000001
21	83	7	0000001
21	86	7	00C00C1
21	89	7	0000001
21	92	7	0000001
21	95	7	CC00001
21	98	7	000C001
22	1	6	0001010
22	4	6	0001010
22	7	6	0001010
22	10	4	CCC10C0
22	13	6	0001010
22	16	6	0001010
22	19	4	CCC1C00

B	G	E	EVS
20	43	7	0011001
20	46	7	CC0C001
20	49	7	0000001
20	55	7	CC0C001
20	58	7	CC00G01
20	64	7	CC10001
20	67	7	CC00001
20	73	3	CC10101
20	76	7	0000001
20	79	7	CC10C01
20	86	7	0000001
20	89	7	CC10001
20	96	7	CC00001
20	99	7	0000001
21	2	7	CC00001
21	5	7	0000001
21	8	7	0001011
21	11	7	CC000C1
21	14	7	CC00001
21	17	7	CC01001
21	20	7	CC000C1
21	23	7	0000001
21	26	7	CC00001
21	30	7	0000001
21	33	7	CC00001
21	36	7	CC00001
21	39	7	0000001
21	42	7	CC00001
21	45	7	0000001
21	48	7	0001001
21	51	7	CC00CC1
21	54	7	0000001
21	57	7	CC00001
21	60	7	CC00001
21	63	7	0000001
21	66	7	CC00001
21	69	7	CC10001
21	72	7	0000001
21	75	7	CC00001
21	78	7	0000001
21	81	7	CC00001
21	84	7	CC00001
21	87	7	0000001
21	90	7	CC00001
21	93	7	CC00001
21	96	7	0000001
21	99	7	CC00001
22	2	6	0001010
22	5	6	CC00C10
22	8	4	0001010
22	11	4	0001010
22	14	6	CC01010
22	17	4	0001010
22	20	4	0001001

B	G	E	EVS
20	44	7	0010001
20	47	7	CC00001
20	53	7	CC1C101
20	56	3	0010001
20	59	7	0000001
20	65	7	0000001
20	68	7	0010001
20	74	7	CC100C1
20	77	7	0000001
20	84	3	CC10101
20	87	7	0000001
20	94	7	0010101
20	97	7	CC00001
21	0	7	0000001
21	3	7	CC0C001
21	6	7	CC000C1
21	9	6	0001011
21	12	7	0000001
21	15	7	0000001
21	18	7	0001001
21	21	7	CC00001
21	24	7	0000001
21	27	7	CC00001
21	31	7	CCCC0C1
21	34	7	0001001
21	37	7	0000001
21	40	7	0000001
21	43	7	0000001
21	46	7	00000C1
21	49	7	0001001
21	52	7	0000001
21	55	7	CC00001
21	58	7	0000001
21	61	7	CC0C001
21	64	7	0000001
21	67	7	CC00001
21	70	7	CC0C001
21	73	7	0000001
21	76	7	0000001
21	79	7	0010001
21	82	7	0000001
21	85	7	00000C1
21	88	7	0000001
21	91	7	0000001
21	94	7	CC000C1
21	97	7	0000001
22	0	6	CC01010
22	3	6	0001010
22	6	6	0000010
22	9	4	CC010C0
22	12	6	0001010
22	15	4	0001010
22	18	4	CC01010
22	21	4	0001000

B	G	E	EVS
22	27	6	0001010
22	25	4	0001010
22	28	4	0001000
22	31	7	0001001
22	34	6	0001010
22	37	4	0001000
22	40	7	0001001
22	43	7	0001001
22	46	4	0001000
22	49	4	0001000
22	52	4	0001001
22	55	4	0001000
22	58	4	0001000
22	61	7	0001001
22	64	7	0001001
22	67	4	0001000
22	70	7	0010001
22	73	7	0001001
22	76	4	0001000
22	79	4	0001000
22	82	4	0001001
22	85	7	0001001
22	88	7	0001001
22	91	4	0001001
22	94	7	0001001
22	97	4	0001001
23	0	4	0001000
23	3	6	0001011
23	6	6	0000010
23	9	6	0000010
23	12	4	0001010
23	15	6	0000010
23	18	6	0001010
23	21	4	0001000
23	24	6	0000010
23	27	6	0000010
23	30	4	0001000
23	33	4	0001010
23	36	6	0000010
23	39	6	0001010
23	42	4	0001000
23	45	6	0000010
23	48	6	0001010
23	51	4	1001000
23	54	4	0001010
23	57	4	0001010
23	60	4	0001000
23	63	4	1001000
23	66	4	1001000
23	69	4	1001000
23	72	4	0001000
23	75	1	1001000
23	78	4	0001000
23	81	4	0001000

B	G	E	EVS
22	23	6	0001010
22	26	4	0001000
22	29	4	0001000
22	32	4	0001011
22	35	4	0001010
22	38	4	0001000
22	41	7	0001001
22	44	4	0001010
22	47	4	0001000
22	50	7	0001001
22	53	4	0001001
22	56	4	0001000
22	59	4	0001000
22	62	4	0001001
22	65	4	0001001
22	68	4	0001000
22	71	7	0001001
22	74	4	0001001
22	77	4	0001000
22	80	7	0000001
22	83	7	0001001
22	86	4	0001001
22	89	4	0001000
22	92	7	0001001
22	95	7	0000001
22	98	4	0001000
23	1	4	0001000
23	4	6	0000010
23	7	6	0000010
23	10	4	0001000
23	13	6	0001010
23	16	6	0000010
23	19	6	0001010
23	22	4	0001000
23	25	6	0000010
23	28	6	0001010
23	31	4	0001000
23	34	6	0000010
23	37	6	0000010
23	40	4	0001000
23	43	4	0001010
23	46	6	0000010
23	49	4	0001010
23	52	4	0001000
23	55	4	0001010
23	58	4	1001010
23	61	4	1001000
23	64	4	1001000
23	67	1	1001000
23	70	4	0001000
23	73	4	0001000
23	76	1	1001000
23	79	4	0001000
23	82	4	0001000

B	G	E	EVS
22	24	6	0001010
22	27	4	0001000
22	30	7	0001001
22	33	6	0001010
22	36	4	0001000
22	39	4	0001000
22	42	7	0001001
22	45	4	0001000
22	48	4	0001000
22	51	4	0001001
22	54	4	0001000
22	57	4	0001000
22	60	7	0010001
22	63	4	0001001
22	66	4	0001000
22	69	4	0001000
22	72	7	0001001
22	75	4	0001001
22	78	4	0001000
22	81	7	0001001
22	84	4	0001001
22	87	7	0001001
22	90	7	0000001
22	93	7	0001001
22	96	4	0001001
22	99	4	0001000
23	2	4	0001000
23	5	6	0000010
23	8	6	0000010
23	11	4	0001000
23	14	6	0000010
23	17	6	0000010
23	20	4	0001000
23	23	6	0001010
23	26	6	0000010
23	29	4	0001010
23	32	4	0001000
23	35	6	0000010
23	38	6	0000010
23	41	4	1001000
23	44	6	0001010
23	47	6	0000010
23	50	4	0001000
23	53	4	0001000
23	56	6	0001010
23	59	1	1011010
23	62	4	1001000
23	65	4	0001000
23	68	1	1001000
23	71	4	0001000
23	74	1	1001000
23	77	4	1001000
23	80	4	0001000
23	83	4	0001000

B	G	E	EVS
23	84	4	0001000
23	87	4	0001000
23	90	4	0001000
23	93	4	0001010
23	96	4	0001000
23	99	4	1001000
24	2	6	0000010
24	5	4	0001000
24	8	4	0011000
24	11	6	0000010
24	14	4	0001000
24	17	3	0011000
24	20	4	0001010
24	23	6	0001010
24	26	3	1011000
24	29	1	1100000
24	32	4	0011000
24	35	1	1010000
24	38	1	1000000
24	41	3	1011000
24	44	3	1010000
24	47	1	1100000
24	50	3	1011000
24	53	4	1001000
24	56	1	1101000
24	59	1	1000000
24	62	4	0001000
24	65	4	0001000
24	68	3	1011000
24	71	4	0001000
24	74	4	0001010
24	77	4	0001000
24	80	4	1001000
24	83	6	0001010
24	86	4	0001000
24	89	3	1011000
24	92	4	1001000
24	95	4	0001000
24	98	4	1011000
25	1	3	1010000
25	4	3	1010000
25	7	3	1010000
25	10	1	1010000
25	13	3	1010000
25	16	1	1010000
25	19	1	1100000
25	22	2	1100000
25	25	1	1110000
25	28	1	1100000
25	31	1	1100000
25	34	1	1100000
25	37	3	1110000
25	40	3	1010000
25	43	1	1010000

B	G	E	EVS
23	85	4	1001000
23	88	4	0001000
23	91	4	0001000
23	94	4	0001010
23	97	4	0001000
24	0	6	0000010
24	3	6	0000010
24	6	4	0001000
24	9	3	0011000
24	12	6	0000010
24	15	4	0001000
24	18	3	1011000
24	21	6	0001010
24	24	3	0011000
24	27	1	1010000
24	30	4	0001000
24	33	4	0011000
24	36	1	1100000
24	39	1	1010000
24	42	3	1010000
24	45	1	1010000
24	48	1	1100000
24	51	1	1011000
24	54	1	1001000
24	57	1	1111000
24	60	1	1001000
24	63	4	0001000
24	66	4	0001000
24	69	1	1000000
24	72	4	0001010
24	75	4	0001000
24	78	4	1011000
24	81	4	1001000
24	84	6	0001010
24	87	4	0001000
24	90	4	1001000
24	93	4	0001000
24	96	4	0001000
24	99	3	1011000
25	2	3	1010000
25	5	3	1010000
25	8	3	1011000
25	11	1	1110000
25	14	3	1010000
25	17	3	1010000
25	20	2	1100000
25	23	3	1110000
25	26	1	1100000
25	29	1	1000000
25	32	1	1100000
25	35	1	1100000
25	38	1	1111000
25	41	3	1010000
25	44	1	1000000

B	G	E	EVS
23	86	4	0001000
23	89	4	0001000
23	92	4	0001000
23	95	4	0001010
23	98	4	1001000
24	1	6	0000010
24	4	4	0001010
24	7	4	0001000
24	10	6	0000010
24	13	6	0001010
24	16	4	0011000
24	19	3	1010000
24	22	6	0001010
24	25	3	0011000
24	28	2	1100000
24	31	4	0011000
24	34	3	0011000
24	37	1	1100000
24	40	4	0011000
24	43	3	1010000
24	46	2	1100000
24	49	3	1010000
24	52	1	1011000
24	55	1	1001000
24	58	2	1110000
24	61	4	1001000
24	64	4	0001000
24	67	4	0001000
24	70	1	1001000
24	73	6	0001010
24	76	4	0001000
24	79	1	1010000
24	82	4	0001010
24	85	4	0001000
24	88	4	1011000
24	91	1	1001000
24	94	4	0001000
24	97	4	0001000
25	0	3	1010000
25	3	3	1010000
25	6	3	1010000
25	9	3	1010000
25	12	1	1110000
25	15	1	1010000
25	18	3	1010000
25	21	1	1100000
25	24	3	1010000
25	27	1	1100000
25	30	1	1010000
25	33	2	1100000
25	36	3	1010000
25	39	4	1001000
25	42	1	1010000
25	45	1	1010000

B	G	E	EVS
25 46	3	1011000	
25 49	4	0001000	
25 52	3	0010000	
25 55	3	0011000	
25 58	4	0011010	
25 61	1	1010000	
25 64	1	1011000	
25 67	4	0001010	
25 70	1	1000000	
25 73	3	1011000	
25 76	4	0001010	
25 79	6	0001010	
25 82	4	1011000	
25 85	4	1001000	
25 88	6	0001010	
25 91	1	1010000	
25 94	4	1011000	
25 97	6	0000010	
26 0	3	1010000	
26 3	3	0011000	
26 6	1	1000000	
26 9	1	1000000	
26 12	1	1010000	
26 15	3	1010000	
26 18	3	1010000	
26 21	3	1111000	
26 24	1	1100000	
26 27	1	1011000	
26 30	4	0001000	
26 33	1	1010000	
26 36	1	1010000	
26 39	4	0011000	
26 42	3	1011000	
26 45	1	1010000	
26 48	4	0001000	
26 51	4	0011000	
26 54	3	1011000	
26 57	1	1010000	
26 60	6	0001010	
26 63	4	0001000	
26 66	1	1010000	
26 69	4	1001000	
26 72	4	0001000	
26 75	4	0011000	
26 78	1	1001000	
26 81	4	0001000	
26 84	4	0001000	
26 87	4	1001000	
26 90	6	0001010	
26 93	4	0001000	
26 96	4	0001000	
26 99	4	0001000	
27 2	4	1011010	
27 5	1	1010000	

B	G	E	EVS
25 47	4	0011000	
25 50	1	1000000	
25 53	3	1010000	
25 56	4	0001000	
25 59	6	0001010	
25 62	3	1011000	
25 65	4	1011000	
25 68	6	0001010	
25 71	1	1010000	
25 74	4	1011000	
25 77	4	0001010	
25 80	1	1010000	
25 83	3	1010000	
25 86	6	0001010	
25 89	4	0001010	
25 92	4	0011000	
25 95	1	1011000	
25 98	6	0000010	
26 1	1	1010000	
26 4	3	1010000	
26 7	1	1100000	
26 10	2	1100000	
26 13	3	0011000	
26 16	1	1000000	
26 19	1	1010000	
26 22	1	1100000	
26 25	1	1100000	
26 28	3	0011000	
26 31	3	0011000	
26 34	1	1000000	
26 37	3	1011000	
26 40	4	0001000	
26 43	3	1010000	
26 46	1	1010000	
26 49	3	0011000	
26 52	3	0011000	
26 55	3	1011000	
26 58	4	1011000	
26 61	6	0011010	
26 64	4	0001000	
26 67	1	1000000	
26 70	4	0001000	
26 73	4	0001000	
26 76	3	1011000	
26 79	4	1001000	
26 82	4	0001000	
26 85	4	0001000	
26 88	4	0001000	
26 91	4	0001010	
26 94	4	0001000	
26 97	4	0001000	
27 0	1	1000000	
27 3	3	0011000	
27 6	3	1010000	

B	G	E	EVS
25 48	4	0011000	
25 51	3	1010000	
25 54	1	1010000	
25 57	4	0011000	
25 60	1	1000000	
25 63	4	0011000	
25 66	4	0001010	
25 69	6	0000010	
25 72	3	1011000	
25 75	4	1001000	
25 78	4	0001010	
25 81	1	1010000	
25 84	4	1001000	
25 87	6	0000010	
25 90	1	1010000	
25 93	3	1011000	
25 96	6	0001010	
25 99	6	0001010	
26 2	3	1011000	
26 5	3	1010000	
26 8	1	1100000	
26 11	2	1100000	
26 14	3	1010000	
26 17	1	1010000	
26 20	4	1001000	
26 23	2	1100000	
26 26	1	1000000	
26 29	1	1010000	
26 32	3	1011000	
26 35	1	1000000	
26 38	4	0011000	
26 41	4	0011000	
26 44	1	1010000	
26 47	1	1011000	
26 50	4	0001010	
26 53	3	1011000	
26 56	1	1010000	
26 59	1	1011010	
26 62	4	0001000	
26 65	4	0011000	
26 68	1	1001000	
26 71	4	0001000	
26 74	4	0001000	
26 77	1	1011000	
26 80	4	0001000	
26 83	4	0001000	
26 86	4	1001000	
26 89	4	0001000	
26 92	4	0001000	
26 95	4	0001000	
26 98	4	0001000	
27 1	4	1011000	
27 4	3	1011000	
27 7	1	1010000	

B	G	E	EVS
27	8	1	1000000
27	11	4	1011010
27	14	3	0011010
27	17	3	1010000
27	20	3	0011000
27	23	6	0010010
27	26	1	1011000
27	29	3	1010000
27	32	6	0000010
27	35	3	1011000
27	38	3	0010000
27	41	4	0011010
27	44	6	0011010
27	47	1	1010000
27	50	6	0001010
27	53	3	1010000
27	56	3	1010000
27	59	3	1010000
27	62	4	0011000
27	65	3	1010000
27	68	3	1010000
27	71	3	0011000
27	74	4	1011000
27	77	3	0010000
27	80	4	1001000
27	83	4	1011000
27	86	3	0011000
27	89	1	1010000
27	92	1	1011000
27	95	3	1011000
27	98	3	1010000
28	1	1	1100000
28	4	1	1010000
28	7	3	0010000
28	10	1	1010000
28	13	3	1010000
28	16	3	0010000
28	19	3	1010000
28	22	3	0010000
28	25	3	0010000
28	28	1	1010000
28	31	3	0010000
28	34	3	0010000
28	37	3	1010000
28	40	3	1010000
28	43	3	1010000
28	46	1	1010000
28	49	1	1000000
28	52	1	1010000
28	55	1	1010000
28	58	1	1000000
28	61	3	1010000
28	64	1	1000000
28	67	1	1000000

B	G	E	EVS
27	9	1	1000000
27	12	4	0011010
27	15	3	0011000
27	18	1	1010000
27	21	4	0011010
27	24	6	0000010
27	27	1	1010000
27	30	4	0011000
27	33	6	0001010
27	36	3	1010000
27	39	3	1010000
27	42	6	0010010
27	45	4	0011000
27	48	3	1010000
27	51	4	0011000
27	54	3	1010000
27	57	1	1010000
27	60	4	0001000
27	63	3	1010000
27	66	1	1010000
27	69	3	1010000
27	72	3	1010000
27	75	4	0011000
27	78	3	1010000
27	81	4	1011000
27	84	4	0011000
27	87	3	1010000
27	90	4	0001000
27	93	3	0010000
27	96	3	1010000
27	99	1	1000000
28	2	1	1100000
28	5	1	1010000
28	8	3	0010000
28	11	1	1010000
28	14	3	0010000
28	17	3	0010000
28	20	3	0010000
28	23	3	0010000
28	26	3	0010000
28	29	1	1000000
28	32	3	0010000
28	35	3	0010000
28	38	1	1010000
28	41	1	1010000
28	44	3	0010000
28	47	1	1010000
28	50	3	1010000
28	53	3	1010000
28	56	1	1010000
28	59	1	1000000
28	62	3	1010000
28	65	1	1000000
28	68	1	1000000

B	G	E	EVS
27	10	4	1011000
27	13	4	0011010
27	16	3	0010000
27	19	1	1010000
27	22	6	0000010
27	25	1	1011010
27	28	3	1010000
27	31	6	0011010
27	34	4	0011010
27	37	3	1010000
27	40	4	0011000
27	43	6	0010010
27	46	3	0010000
27	49	3	1010000
27	52	3	0011000
27	55	3	1010000
27	58	3	1010000
27	61	4	0001000
27	64	3	0010000
27	67	1	1010000
27	70	4	1001000
27	73	3	1010000
27	76	3	0011000
27	79	3	1010000
27	82	3	1010000
27	85	4	0011000
27	88	1	1010000
27	91	4	1011000
27	94	3	1011000
27	97	1	1010000
28	0	1	1100000
28	3	1	1100000
28	6	3	0010000
28	9	3	1010000
28	12	1	1010000
28	15	3	0010000
28	18	3	0010000
28	21	3	0010000
28	24	3	0010000
28	27	3	0010000
28	30	3	1010000
28	33	3	0010000
28	36	3	1010000
28	39	1	1000000
28	42	3	1010000
28	45	3	1010000
28	48	1	1000000
28	51	3	1010000
28	54	1	1010000
28	57	1	1000000
28	60	1	1010000
28	63	1	1010000
28	66	1	1000000
28	69	1	1000000

B	G	E	EVS
28 70	3	1010000	
28 73	1	1000000	
28 76	1	1000000	
28 79	1	1010000	
28 82	1	1010000	
28 85	1	1010000	
28 88	3	1010000	
28 91	1	1000000	
28 94	3	1010000	
28 97	3	0010000	
29 0	1	1010000	
29 3	1	1000000	
29 6	3	1010000	
29 9	3	0010000	
29 12	1	1000000	
29 15	3	1010000	
29 18	1	1010000	
29 26	3	0010010	
30 5	7	0010101	
30 8	7	0000001	
30 17	7	0000001	
30 26	7	0010101	
30 29	7	0000001	
30 48	5	0010100	
31 1	7	0000001	
31 4	7	0000001	
31 7	7	0000001	
31 10	7	0000001	
31 13	7	0000001	
31 16	7	0000001	
31 19	7	0000001	
31 22	7	0000001	
31 25	7	0000001	
31 28	7	0000001	
31 31	7	0000001	
31 34	7	0000001	
31 37	7	0000001	
31 40	7	0000001	
31 43	7	0000001	
31 46	7	0000001	
31 49	7	0000001	
31 52	7	0000001	
31 55	7	0000001	
31 58	7	0000001	
31 62	7	0000001	
31 65	7	0000001	
31 68	7	0000001	
31 73	7	0000001	
31 76	7	0000001	
31 79	7	0000001	
31 85	7	0000001	
31 88	7	0000001	
31 96	7	0000001	
31 99	7	0000001	

B	G	E	EVS
28 71	1	1000000	
28 74	1	1000000	
28 77	1	1000000	
28 80	1	1010000	
28 83	1	1000000	
28 86	1	1010000	
28 89	3	0010000	
28 92	3	1010000	
28 95	3	1010000	
28 98	3	0010000	
29 1	1	1000000	
29 4	1	1010000	
29 7	1	1010000	
29 10	1	1000000	
29 13	1	1000000	
29 16	3	1010000	
29 19	3	1010000	
29 27	6	0010010	
30 6	7	0000001	
30 9	7	0000001	
30 18	7	0000001	
30 27	7	0010101	
30 38	7	0010101	
30 49	7	0010101	
31 2	7	0000001	
31 5	7	0000001	
31 8	7	0000001	
31 11	7	0000001	
31 14	7	0000001	
31 17	7	0000001	
31 20	7	0000001	
31 23	7	0000001	
31 26	7	0000001	
31 29	7	0000001	
31 32	7	0000001	
31 35	7	0000001	
31 38	7	0000001	
31 41	7	0000001	
31 44	7	0000001	
31 47	7	0000001	
31 50	7	0010101	
31 53	7	0000001	
31 56	7	0000001	
31 59	7	0000001	
31 63	7	0000001	
31 66	7	0000001	
31 69	7	0000001	
31 74	7	0000001	
31 77	7	0000001	
31 83	7	0010101	
31 86	7	0000001	
31 89	7	0000001	
31 97	7	0000001	
32 0	7	0001001	

B	G	E	EVS
28 72	1	1000000	
28 75	1	1000000	
28 78	1	1000000	
28 81	1	1000000	
28 84	1	1000000	
28 87	3	1010000	
28 90	1	1000000	
28 93	1	1010000	
28 96	3	1010000	
28 99	3	0010000	
29 2	1	1000000	
29 5	3	1010000	
29 8	3	1010000	
29 11	1	1000000	
29 14	1	1010000	
29 17	3	1010000	
29 23	1	1000000	
29 29	1	1010000	
30 7	7	0000001	
30 16	7	0010101	
30 19	7	0000001	
30 28	7	0000001	
30 39	7	0000001	
31 6	7	0000001	
31 9	7	0000001	
31 12	7	0000001	
31 15	7	0000001	
31 18	7	0000001	
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31 24	7	0000001	
31 27	7	0000001	
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31 39	7	0000001	
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31 48	7	0000001	
31 51	7	0000001	
31 54	7	0000001	
31 57	7	0000001	
31 61	7	0010101	
31 64	7	0000001	
31 67	7	0000001	
31 72	7	0010101	
31 75	7	0000001	
31 78	7	0000001	
31 84	7	0000001	
31 87	7	0000001	
31 95	7	0000001	
31 98	7	0000001	
32 1	7	0000001	

B	G	E	EVS
32	2	7	0000001
32	5	7	0001001
32	8	4	0001000
32	11	7	0000001
32	14	7	0000001
32	17	4	0001001
32	20	7	0000001
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32	38	4	0001001
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32	53	7	0000001
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32	65	7	0000001
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32	71	7	0000001
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32	86	7	0000001
32	89	7	0000001
32	92	7	0000001
32	95	7	0000001
32	98	7	0000001
33	1	6	0001010
33	4	4	0001010
33	7	1	1001000
33	10	7	0001001
33	13	6	0001010
33	16	4	0001010
33	19	4	0001000
33	22	6	0001010
33	25	4	0001001
33	28	4	0001000
33	31	4	0001011
33	34	7	0001001
33	37	4	0001001
33	40	4	0001001
33	43	7	0001001
33	46	4	0001001
33	49	4	0001000
33	52	7	0001001
33	55	7	0001001
33	58	4	0001000
33	61	7	0000001

B	G	E	EVS
32	3	7	0000001
32	6	7	0001001
32	9	4	0001000
32	12	7	0000001
32	15	7	0000001
32	18	4	0001001
32	21	7	0000001
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32	54	7	0000001
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32	75	7	0000001
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32	81	7	0000001
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32	87	7	0000001
32	90	7	0000001
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32	96	7	0000001
32	99	7	0000001
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33	5	6	0001010
33	8	4	1001000
33	11	6	0001010
33	14	4	0001010
33	17	4	1001000
33	20	7	0001001
33	23	6	0001010
33	26	4	0001001
33	29	4	0001000
33	32	4	0001011
33	35	7	0001001
33	38	4	0001000
33	41	7	0001001
33	44	7	0001001
33	47	4	0001000
33	50	7	0000001
33	53	4	0001001
33	56	7	0001001
33	59	4	0001000
33	62	7	0001001

B	G	E	EVS
22	4	7	0001001
32	7	4	0001001
32	10	7	0000001
32	13	7	0000001
32	16	7	0000001
32	19	4	0001001
32	22	7	0000001
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32	43	7	0000001
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32	49	7	0001001
32	52	7	0000001
32	55	7	0000001
32	58	7	0001001
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32	64	7	0000001
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32	76	7	0000001
32	79	7	0000001
32	82	7	0000001
32	85	7	0000001
32	88	7	0000001
32	91	7	0000001
32	94	7	0000001
32	97	7	0000001
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33	6	4	0001010
33	9	4	0001000
33	12	6	0001010
33	15	4	0001010
33	18	4	0001000
33	21	6	0001010
33	24	6	0001010
33	27	4	0001000
33	30	7	0001001
33	33	4	0001011
33	36	7	0001001
33	39	4	0001000
33	42	7	0000001
33	45	7	0001001
33	48	4	0001000
33	51	7	0000001
33	54	4	0001001
33	57	4	0001000
33	60	7	0000001
33	63	7	0001001

B	G	F	EVS
33	64	7	0001001
33	67	4	0001000
33	70	7	0000001
33	73	7	0010001
33	76	7	0000001
33	79	4	0001000
33	82	7	0011001
33	85	7	0001001
33	88	4	1001000
33	91	7	0001001
33	94	7	0011001
33	97	4	1001000
34	0	4	0001001
34	3	4	0001000
34	6	4	0001000
34	9	4	1011000
34	12	4	0001000
34	15	4	0001000
34	18	1	1001000
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34	24	4	0001000
34	27	4	1001000
34	30	4	0001000
34	33	4	0001000
34	36	4	0001000
34	39	3	1011000
34	42	4	0001000
34	45	4	1001000
34	48	1	1001000
34	51	4	0001000
34	54	1	1001000
34	57	4	1001000
34	60	4	0001000
34	63	1	1001000
34	66	4	1001000
34	69	4	0001000
34	72	4	1001000
34	75	1	1001000
34	78	4	0001000
34	81	1	1001000
34	84	1	1001000
34	87	4	0001000
34	90	4	0001000
34	93	4	0001000
34	96	4	0001000
34	99	4	0001001
35	2	4	0011000
35	5	1	1011000
35	8	6	0000010
35	11	4	0001000
35	14	4	1011000
35	17	4	0011010
35	20	4	0001000
35	23	4	1001000

B	G	E	EVS
33	65	7	0001001
33	68	4	0001000
33	71	7	0000001
33	74	7	0001001
33	77	7	0001001
33	80	7	0000001
33	83	3	0011001
33	86	7	0001001
33	89	1	1001000
33	92	7	0001001
33	95	7	0001001
33	98	1	1001001
34	1	4	0001000
34	4	4	0001000
34	7	1	1001000
34	10	4	0001000
34	13	4	0001000
34	16	4	1001000
34	19	1	1000000
34	22	4	0001000
34	25	4	0001000
34	28	1	1001000
34	31	4	0001000
34	34	4	0001000
34	37	4	1001000
34	40	4	0001000
34	43	4	0001000
34	46	1	1001000
34	49	4	0001000
34	52	4	0001000
34	55	1	1001000
34	58	4	0001000
34	61	4	1001000
34	64	4	1001001
34	67	4	0001000
34	70	1	1001000
34	73	4	0001000
34	76	4	0001000
34	79	4	0001000
34	82	4	0001000
34	85	4	0001000
34	88	4	0001000
34	91	4	0001000
34	94	4	0001001
34	97	4	0001000
35	0	1	1010000
35	3	4	0011000
35	6	4	0011010
35	9	6	0000010
35	12	4	0001000
35	15	4	1011000
35	18	6	0001010
35	21	4	0001000
35	24	4	1011000

B	G	E	EVS
33	66	7	0001001
33	69	4	0001000
33	72	7	0010001
33	75	7	0001001
33	78	4	0001000
33	81	7	0001001
33	84	3	0011001
33	87	4	0001001
33	90	7	0001001
33	93	7	0011001
33	96	4	0001001
33	99	4	1001000
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34	5	4	0001000
34	8	4	1011000
34	11	4	0001000
34	14	4	0001000
34	17	4	1001000
34	20	4	0001000
34	23	4	0001000
34	26	4	0001000
34	29	1	1001000
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34	41	4	0001000
34	44	4	0001000
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34	56	1	1001000
34	59	4	0001000
34	62	1	1001000
34	65	4	1001000
34	68	4	0001000
34	71	1	1000000
34	74	4	1001000
34	77	4	0001000
34	80	1	1001000
34	83	4	0001000
34	86	4	0001000
34	89	4	0001000
34	92	4	0001000
34	95	4	0001000
34	98	4	0001000
35	1	4	1011000
35	4	4	1011000
35	7	6	0011010
35	10	4	1011000
35	13	4	1001000
35	16	3	0011000
35	19	6	0000010
35	22	4	0001000
35	25	4	0001000

B	G	E	EVS
35 26	4	0011000	
35 29	6	0000010	
35 32	4	0001000	
35 35	4	0001000	
35 38	4	0001010	
35 41	4	0001000	
35 44	4	1001000	
35 47	4	0001000	
35 50	4	0001000	
35 53	4	1001000	
35 56	4	0001000	
35 59	4	0001000	
35 62	4	1001000	
35 65	4	0001000	
35 68	4	0001000	
35 71	4	0001000	
35 74	4	0001000	
35 77	6	0001010	
35 80	4	0001000	
35 83	4	0001010	
35 86	6	0001010	
35 89	4	0001000	
35 92	6	0001010	
35 95	6	0001010	
35 98	6	0001010	
36 1	6	0000010	
36 4	4	0001000	
36 7	4	0001000	
36 10	6	0000010	
36 13	6	0001010	
36 16	4	0001000	
36 19	3	1011000	
36 22	4	0001010	
36 25	4	0001000	
36 28	4	1001000	
36 31	6	0001010	
36 34	4	1001000	
36 37	4	1011000	
36 40	4	0001000	
36 43	4	1001000	
36 46	3	1011000	
36 49	1	1010000	
36 52	4	0001000	
36 55	4	1011000	
36 58	3	1010000	
36 61	4	0001000	
36 64	4	1001000	
36 67	1	1010000	
36 70	4	0001000	
36 73	1	1001000	
36 76	1	1011000	
36 79	4	0011000	
36 82	4	1001000	
36 85	1	1011000	

B	G	E	EVS
35 27	4	0011010	
35 30	4	1011000	
35 33	4	1001000	
35 36	4	0001000	
35 39	4	0001010	
35 42	4	0001000	
35 45	4	0001000	
35 48	4	0001000	
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35 54	4	1001000	
35 57	4	0001000	
35 60	4	0001000	
35 63	4	1001000	
35 66	4	0001000	
35 69	4	0001000	
35 72	4	0001000	
35 75	4	0001010	
35 78	4	0001010	
35 81	4	0001000	
35 84	4	0001010	
35 87	6	0001010	
35 90	4	0001000	
35 93	6	0001010	
35 96	6	0000010	
35 99	4	0001010	
36 2	6	0001010	
36 5	4	0001000	
36 8	4	0001000	
36 11	6	0000010	
36 14	4	0001000	
36 17	4	0001000	
36 20	6	0000010	
36 23	6	0001010	
36 26	4	1001000	
36 29	3	1010000	
36 32	6	0001010	
36 35	4	1001000	
36 38	1	1011000	
36 41	4	0001000	
36 44	4	1001000	
36 47	3	1011000	
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36 56	3	1010000	
36 59	1	1010000	
36 62	4	0001000	
36 65	1	1011000	
36 68	1	1001000	
36 71	4	0001000	
36 74	1	1011000	
36 77	4	0001000	
36 80	4	0001000	
36 83	1	1001000	
36 86	3	1011000	

B	G	E	EVS
35 28	6	0001010	
35 31	4	1001000	
35 34	4	1001000	
35 37	4	0001000	
35 40	4	0001000	
35 43	4	1001000	
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35 64	4	0001000	
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35 70	4	0001000	
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35 76	4	0001010	
35 79	4	0001000	
35 82	4	0001000	
35 85	6	0001010	
35 88	6	0001010	
35 91	4	0001000	
35 94	6	0001010	
35 97	6	0001010	
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36 6	4	0001000	
36 9	4	0011000	
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36 15	4	0001000	
36 18	4	0001000	
36 21	6	0000010	
36 24	4	0001000	
36 27	4	1001000	
36 30	4	0001010	
36 33	4	1001010	
36 36	4	1011000	
36 39	3	1011000	
36 42	4	0001000	
36 45	1	1011000	
36 48	4	1011000	
36 51	4	0001000	
36 54	4	1001000	
36 57	3	1010000	
36 60	4	0001000	
36 63	4	0001000	
36 66	1	1010000	
36 69	4	1011000	
36 72	4	1001000	
36 75	1	1010000	
36 78	4	0011000	
36 81	4	1001000	
36 84	1	1011000	
36 87	1	1011000	

B	G	E	EVS
36 88	1	1011000	
36 91	4	1001000	
36 94	4	0001000	
36 97	4	0011000	
37 0	4	0011000	
37 3	1	1010000	
37 6	1	1000000	
37 9	1	1010000	
37 12	3	1010000	
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37 18	4	1011000	
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37 45	4	1011000	
37 48	1	1010000	
37 51	3	0011000	
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37 69	1	1000000	
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37 75	1	1010000	
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37 81	1	1010000	
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37 90	4	1011000	
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37 96	3	0011000	
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38 29	3	0010000	
38 32	3	1010000	
38 35	3	1010000	
38 38	3	1010000	
38 41	3	1010000	
38 44	1	1010000	
38 47	1	1010000	

B	G	E	EVS
36 89	4	1011000	
36 92	1	1001000	
36 95	4	0001000	
36 98	4	0001000	
37 1	3	0011000	
37 4	1	1010000	
37 7	1	1000000	
37 10	3	1010000	
37 13	1	1010000	
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37 25	1	1001000	
37 28	3	1011000	
37 31	1	1010000	
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37 40	1	1010000	
37 43	4	1001000	
37 46	3	1011000	
37 49	3	1010000	
37 52	1	1011000	
37 55	1	1011000	
37 58	3	1010000	
37 61	3	1011000	
37 64	1	1011000	
37 67	1	1000000	
37 70	3	1010000	
37 73	1	1001000	
37 76	1	1000000	
37 79	1	1011000	
37 82	1	1011000	
37 85	1	1011000	
37 88	1	1010000	
37 91	1	1011000	
37 94	4	1001000	
37 97	3	1010000	
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38 30	1	1010000	
38 33	1	1010000	
38 36	3	0010000	
38 39	3	1010000	
38 42	1	1010000	
38 45	3	1010000	
38 48	1	1010000	

B	G	E	EVS
36 90	4	0001000	
36 93	1	1001000	
36 96	4	0011000	
36 99	4	0001000	
37 2	3	1010000	
37 5	1	1000000	
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37 14	1	1000000	
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37 38	1	1010000	
37 41	1	1011000	
37 44	4	1011000	
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37 50	4	1011000	
37 53	4	1001000	
37 56	1	1010000	
37 59	1	1010000	
37 62	4	1001000	
37 65	1	1010000	
37 68	1	1000000	
37 71	1	1010000	
37 74	3	1010000	
37 77	1	1010000	
37 80	3	1011000	
37 83	1	1010000	
37 86	1	1000000	
37 89	3	1011000	
37 92	1	1011000	
37 95	3	0011000	
37 98	3	1010000	
38 1	1	1010000	
38 4	3	0010000	
38 7	3	0010000	
38 10	3	1010000	
38 13	1	1010000	
38 16	3	1010000	
38 19	3	0010000	
38 22	1	1010000	
38 25	3	0010000	
38 28	3	0010000	
38 31	3	1010000	
38 34	3	1010000	
38 37	3	0010000	
38 40	1	1010000	
38 43	1	1010000	
38 46	3	1010000	
38 49	3	1010000	

B	G	E	EVS
38 50	1	1010000	
38 53	1	1010000	
38 56	3	1011000	
38 59	4	0C11000	
38 62	3	1010000	
38 65	4	0011000	
38 68	4	CC11000	
38 71	1	1001000	
38 74	4	0001000	
38 77	4	0001000	
38 80	4	0001000	
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38 86	4	0001000	
38 89	4	0001000	
38 92	4	1001000	
38 95	4	0001000	
38 98	4	0001000	
41 8	7	0000001	
41 19	7	0000001	
41 88	4	1001000	
41 97	4	0001000	
42 0	7	0000001	
42 3	7	0000001	
42 6	7	0000001	
42 9	7	0000001	
42 13	7	0000001	
42 16	7	0000001	
42 19	7	0000001	
42 25	7	0000001	
42 28	7	0000001	
42 35	7	0000001	
42 38	7	0010001	
42 44	4	0001000	
42 47	4	0001001	
42 55	4	0001000	
42 58	4	1101000	
42 63	4	0001000	
42 66	4	1001000	
42 69	1	1101000	
42 73	4	1001000	
42 76	4	1001000	
42 79	4	0001000	
42 82	4	1001000	
42 85	4	1001000	
42 88	4	0001000	
42 91	4	0001000	
42 94	4	1001000	
42 97	4	0001000	
43 0	7	0000001	
43 3	4	0011001	
43 6	4	1001000	
43 9	4	0001000	
43 12	7	0011001	
43 15	1	1100000	

B	G	E	EVS
38 51	1	1010000	
38 54	1	1010000	
38 57	4	1011000	
38 60	1	1010000	
38 63	3	1011000	
38 66	4	0011000	
38 69	4	0001000	
38 72	1	1001000	
38 75	4	0001000	
38 78	4	0001000	
38 81	4	1001000	
38 84	4	0001000	
38 87	4	0001000	
38 90	4	1011000	
38 93	4	1001000	
38 96	4	0001000	
38 99	4	0001000	
41 5	7	0000001	
41 78	4	0001000	
41 95	4	0001000	
41 98	4	1001000	
42 1	7	0000001	
42 4	7	0000001	
42 7	7	0000001	
42 10	7	0000001	
42 14	7	0000001	
42 17	7	0000001	
42 23	7	0000001	
42 26	7	0000001	
42 29	7	0000001	
42 36	7	0000001	
42 39	7	0001001	
42 45	4	0001001	
42 48	4	0011001	
42 56	4	1001000	
42 59	4	0101000	
42 64	4	0001000	
42 67	4	1001000	
42 71	4	1001000	
42 74	4	1001000	
42 77	1	1001000	
42 80	4	0001000	
42 83	4	1001000	
42 86	4	0001000	
42 89	4	0001000	
42 92	4	1001000	
42 95	4	0001000	
42 98	4	0001000	
43 1	7	0001001	
43 4	4	0001001	
43 7	1	1001000	
43 10	7	0010001	
43 13	4	1001000	
43 16	1	1000000	

B	G	E	EVS
33 52	1	1010000	
33 55	1	1010000	
38 58	4	CC11000	
38 61	3	1010000	
38 64	4	0011000	
38 67	4	0001000	
38 70	4	1001000	
38 73	4	0001000	
38 76	4	0001000	
38 79	4	0001000	
38 82	1	1001000	
38 85	4	0001000	
38 88	4	0001000	
38 91	4	0001000	
38 94	4	0001000	
38 97	4	0001000	
41 7	7	0000101	
41 18	5	0000101	
41 87	4	1001000	
41 96	4	0001000	
41 99	4	1001000	
42 2	7	0000001	
42 5	7	0000001	
42 8	7	0000001	
42 12	7	0000001	
42 15	7	0000001	
42 18	7	0000001	
42 24	7	0000001	
42 27	7	0000001	
42 33	7	0000001	
42 37	7	0000001	
42 43	4	0001000	
42 46	7	0001001	
42 49	3	0011001	
42 57	1	1101000	
42 62	4	0001000	
42 65	4	1001000	
42 68	4	1101000	
42 72	4	1001000	
42 75	1	1001000	
42 78	4	0001000	
42 81	4	0001000	
42 84	1	1001000	
42 87	4	0001000	
42 90	4	0001000	
42 93	1	1001000	
42 96	4	0001000	
42 99	4	0001000	
43 2	7	0010001	
43 5	4	1001001	
43 8	1	1001000	
43 11	7	0010001	
43 14	1	1101000	
43 17	4	1001000	

B	G	E	EVS
43	18	4	0001000
43	21	7	0010001
43	24	1	1101000
43	27	4	0001000
43	30	7	0010001
43	33	4	1101000
43	36	4	0001010
43	39	4	0001000
43	42	4	0101001
43	45	6	0001010
43	48	4	0001000
43	51	2	1101000
43	54	6	0001010
43	57	4	0001000
43	60	4	1001000
43	63	4	0001000
43	66	4	0001000
43	69	4	0001000
43	72	6	0001010
43	75	4	0001000
43	78	4	0001100
43	81	6	0001010
43	84	4	0001000
43	90	4	0001010
43	93	4	0001000
44	0	4	0001001
44	3	4	0001000
44	6	4	0001000
44	9	4	0001000
44	12	4	0001001
44	15	4	0001000
44	18	4	0001001
44	21	7	0000001
44	24	7	0001001
44	27	4	0001001
44	30	4	0001000
44	33	4	0001001
44	36	7	0000001
44	39	4	0001011
44	42	7	0001001
44	45	7	0001001
44	48	7	0000001
44	51	7	0001001
44	54	4	0001001
44	57	7	0000001
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44	63	4	0001001
44	66	7	0001001
44	69	4	0001001
44	72	5	0001101
44	75	7	0001001
44	78	7	0000001
44	87	7	0001101
44	98	7	0001101

B	G	E	EVS
43	19	4	0001000
43	22	4	0011001
43	25	4	1001000
43	28	4	0001000
43	31	7	0010001
43	34	4	1101000
43	37	4	0001000
43	40	7	0011001
43	43	1	1101000
43	46	4	0001000
43	49	4	0001000
43	52	4	1101000
43	55	6	0001010
43	58	4	0001000
43	61	4	1001010
43	64	6	0001010
43	67	4	0001000
43	70	4	0001000
43	73	4	0001010
43	76	4	0001000
43	79	4	0001100
43	82	4	0001010
43	85	4	0001000
43	91	4	0001010
43	94	4	0001100
44	1	4	0001000
44	4	4	0001000
44	7	4	0001000
44	10	7	0001001
44	13	7	0001001
44	16	4	0001000
44	19	4	0001001
44	22	7	0001001
44	25	7	0001001
44	28	7	0001001
44	31	4	0001001
44	34	7	0001001
44	37	7	0000001
44	40	4	0001000
44	43	4	0001001
44	46	7	0000001
44	49	7	0001001
44	52	7	0001001
44	55	7	0001001
44	58	7	0000001
44	61	4	0001001
44	64	7	0001001
44	67	7	0000001
44	70	5	0001100
44	73	7	0001101
44	76	7	0001001
44	79	4	0001001
44	88	7	0001001
44	99	7	0001001

B	G	E	EVS
43	20	7	0000001
43	23	4	1001000
43	26	1	1001000
43	29	4	0001000
43	32	7	0001001
43	35	4	0001010
43	38	4	0001000
43	41	7	0001001
43	44	6	1001010
43	47	4	0001000
43	50	2	1101000
43	53	4	1001000
43	56	6	0001010
43	59	4	0001000
43	62	4	0001010
43	65	4	0001010
43	68	4	0001000
43	71	4	0001010
43	74	4	0001000
43	77	4	0001000
43	80	4	0001010
43	83	4	0001000
43	86	4	0001100
43	92	6	0001010
43	95	5	0001100
44	2	4	0001000
44	5	4	0001000
44	8	4	0001000
44	11	7	0001001
44	14	7	0001001
44	17	4	0001001
44	20	7	0000001
44	23	4	0001001
44	26	7	0001001
44	29	7	0001001
44	32	4	0001001
44	35	7	0001001
44	38	7	0000001
44	41	4	0001001
44	44	7	0001001
44	47	7	0000001
44	50	4	0001000
44	53	4	0001001
44	56	7	0001001
44	59	7	0001001
44	62	4	0001001
44	65	4	0001001
44	68	7	0000001
44	71	4	0001100
44	74	7	0001101
44	77	7	0000001
44	86	5	0001101
44	89	4	0001001
45	0	4	0001000

B	G	E	EVS
45	1	4	0011000
45	4	3	0010010
45	7	3	0010010
45	10	4	0001000
45	13	4	0011000
45	16	3	0010010
45	19	3	1010000
45	22	7	0001001
45	25	1	1001000
45	28	3	1010000
45	31	4	0001010
45	34	4	1001000
45	37	3	1010000
45	40	4	0001010
45	43	7	0001001
45	46	3	0011000
45	49	3	1011000
45	52	4	0001000
45	55	4	0001000
45	58	4	0001000
45	61	7	0001001
45	64	4	0001000
45	67	4	0001000
45	70	7	0001001
45	73	4	0001000
45	76	4	0001000
45	79	1	1001000
45	82	7	0001001
45	85	4	0001000
45	88	4	1001000
45	91	4	0001001
45	94	4	0001000
45	97	4	0001000
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46	3	4	1001000
46	6	4	0001000
46	9	4	1001000
46	12	1	1001000
46	15	4	0001000
46	18	4	1001000
46	21	4	1001000
46	24	4	0001000
46	27	4	0001000
46	30	4	1001000
46	33	4	0001000
46	36	4	0001000
46	39	4	1001000
46	42	4	0001000
46	45	4	1001000
46	48	4	0001000
46	51	4	0001000
46	54	4	0001000
46	57	4	0001000
46	60	4	1001000

B	G	E	EVS
45	2	3	0011000
45	5	6	0010010
45	8	3	0010000
45	11	4	0001000
45	14	6	0011010
45	17	3	0010000
45	20	4	0001000
45	23	4	0001001
45	26	3	0010000
45	29	3	0010000
45	32	7	0001011
45	35	4	1011000
45	38	3	1010000
45	41	6	0001011
45	44	4	0001001
45	47	3	0010000
45	50	4	0001000
45	53	4	0001000
45	56	4	0001000
45	59	4	1001000
45	62	4	0001000
45	65	4	0001000
45	68	4	0001000
45	71	7	0001001
45	74	4	0001000
45	77	4	0001000
45	80	7	0001001
45	83	7	0001001
45	86	4	0001000
45	89	4	1001000
45	92	7	0001001
45	95	4	0001000
45	98	4	1001000
46	1	4	1001000
46	4	4	0001000
46	7	4	0001000
46	10	1	1001000
46	13	4	0001000
46	16	4	0001000
46	19	1	1001000
46	22	4	1001000
46	25	4	0001000
46	28	4	1001000
46	31	1	1001000
46	34	4	0001000
46	37	1	1001000
46	40	4	1001000
46	43	4	0001000
46	46	4	1001000
46	49	4	1001000
46	52	4	0001000
46	55	4	1001000
46	58	4	0001000
46	61	4	0001000

B	G	E	EVS
45	3	3	0011000
45	6	6	0010010
45	9	3	0010000
45	12	4	0001000
45	15	3	0010010
45	18	3	0010000
45	21	4	0001000
45	24	3	1011000
45	27	3	1010000
45	30	6	0001010
45	33	4	0001001
45	36	3	1010000
45	39	3	1011000
45	42	7	0001001
45	45	4	0001001
45	48	3	1010000
45	51	4	0001000
45	54	4	0001000
45	57	4	0001000
45	60	7	0001001
45	63	4	0001000
45	66	4	0001000
45	69	4	1001000
45	72	4	0001001
45	75	4	0001000
45	78	4	0001000
45	81	4	0001001
45	84	4	0001001
45	87	4	0001000
45	90	7	0001001
45	93	7	0001001
45	96	4	0001000
45	99	4	1001000
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46	5	4	0001000
46	8	4	0001000
46	11	4	1001000
46	14	4	0001000
46	17	4	0001000
46	20	4	1001000
46	23	4	0001000
46	26	4	0001000
46	29	4	0001000
46	32	4	0001000
46	35	4	0001000
46	38	4	1001000
46	41	4	1001000
46	44	4	0001000
46	47	4	1001000
46	50	4	1001000
46	53	4	0001000
46	56	4	0001000
46	59	4	0001000
46	62	4	0001000

B	G	E	EVS
46	63	4	0001000
46	66	4	0001000
46	69	4	0001000
46	72	4	0001000
46	75	4	0001010
46	78	4	0001010
46	81	4	0001000
46	84	4	0001001
46	87	6	0000010
46	90	4	0001010
46	93	7	0001001
46	96	6	0001010
46	99	7	0000001
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47	5	4	1001000
47	8	3	1010000
47	11	4	1001000
47	14	4	0001000
47	17	4	0011000
47	20	4	1001000
47	23	4	1001000
47	26	4	0001010
47	29	3	1010000
47	32	4	1001000
47	35	4	0001010
47	38	3	1011000
47	41	4	0001000
47	44	1	1001000
47	47	4	0001000
47	50	4	0001000
47	53	4	1001000
47	56	4	0001010
47	59	1	1001000
47	62	4	0001000
47	65	1	1001000
47	68	4	1001000
47	71	4	0001000
47	74	4	0001000
47	77	4	1001000
47	80	7	0001001
47	83	4	0001001
47	86	4	1001000
47	89	4	0001000
47	92	4	0001000
47	95	7	0000001
47	98	7	0001001
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48	4	4	0001000
48	7	4	0001000
48	10	4	1011000
48	13	4	1001000
48	16	4	0001000
48	19	4	0001000
48	22	4	1001000

B	G	E	EVS
46	64	4	0001000
46	67	6	0001010
46	70	4	0001000
46	73	4	0001000
46	76	4	0001010
46	79	4	0001000
46	82	4	0001001
46	85	4	0001010
46	88	6	0001010
46	91	4	0001010
46	94	7	0001001
46	97	6	0001011
47	0	1	1011000
47	3	4	1001000
47	6	4	0011000
47	9	3	1010000
47	12	4	1001000
47	15	4	0001000
47	18	3	1010000
47	21	4	0001000
47	24	4	0001000
47	27	4	1001010
47	30	4	0001000
47	33	4	1001000
47	36	6	0001010
47	39	3	0011000
47	42	4	0001000
47	45	4	0001010
47	48	1	1001000
47	51	4	0001000
47	54	4	1001000
47	57	4	1001010
47	60	4	0001000
47	63	4	0001000
47	66	6	0001010
47	69	4	1001000
47	72	4	0001000
47	75	4	1001000
47	78	1	1001000
47	81	4	0001001
47	84	4	0001001
47	87	4	0001000
47	90	4	1001000
47	93	4	1001000
47	96	7	0000001
47	99	4	0001000
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48	5	4	0001000
48	8	4	0001000
48	11	4	1001000
48	14	4	0001000
48	17	4	0001000
48	20	1	1011000
48	23	1	1001000

B	G	E	EVS
46	65	4	0001000
46	68	4	0001010
46	71	4	0001000
46	74	4	0001000
46	77	6	0001010
46	80	4	0001000
46	83	4	0001001
46	86	6	0001010
46	89	7	0001001
46	92	4	0001001
46	95	4	0001001
46	98	7	0001011
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47	4	4	0001000
47	7	3	1011000
47	10	1	1001000
47	13	1	1001000
47	16	4	0001000
47	19	3	1010000
47	22	1	1001000
47	25	4	0001000
47	28	3	1010000
47	31	4	0001000
47	34	4	1001000
47	37	4	1001010
47	40	4	0001000
47	43	4	1001000
47	46	6	0001010
47	49	3	0011000
47	52	4	0001000
47	55	4	1001000
47	58	1	1001000
47	61	4	0001000
47	64	4	1001000
47	67	4	1001010
47	70	4	0001000
47	73	4	0001000
47	76	4	1001010
47	79	4	0001000
47	82	4	0001001
47	85	7	1001001
47	88	4	1001000
47	91	4	1001000
47	94	4	0001000
47	97	7	0000001
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48	6	4	0001000
48	9	4	0001000
48	12	1	1001000
48	15	4	0001000
48	18	4	0001000
48	21	4	0001000
48	24	4	1001000

B	G	E	EVS
48	25	4	1001000
48	28	4	0001000
48	31	4	1001000
48	34	6	0001010
48	37	1	1001000
48	40	4	0001000
48	43	4	1001010
48	46	4	0001010
48	49	4	0001000
48	52	4	1001000
48	55	4	1001000
48	58	4	0001000
48	61	4	0001000
48	64	4	1001000
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48	70	4	1001000
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48	76	4	0001010
48	79	6	0000010
48	82	4	0001000
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48	91	4	0001000
48	94	4	0001000
48	97	6	0001010
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52	15	4	0001000
52	18	4	0001000
52	21	4	1001000
52	24	4	0001000
52	27	4	0001000
52	32	4	0001000
52	35	4	0001000

B	G	E	EVS
48	26	4	0001000
48	29	4	0001000
48	32	4	1001000
48	35	4	1001010
48	38	4	0001000
48	41	4	1001000
48	44	4	1001010
48	47	4	1001000
48	50	4	0001000
48	53	4	1001000
48	56	4	0001000
48	59	4	0001000
48	62	4	0001000
48	65	4	0001000
48	68	4	0001010
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48	98	6	0001010
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52	16	4	0001000
52	19	4	0001100
52	22	4	0001000
52	25	4	0001000
52	30	1	1001000
52	33	4	0001000
52	36	4	0001000

B	G	E	EVS
48	27	4	0001000
48	30	4	1011000
48	33	4	0001010
48	36	4	1001000
48	39	4	0001000
48	42	4	1001000
48	45	4	0001010
48	48	4	1001000
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48	54	4	1001000
48	57	4	0001000
48	60	4	1001000
48	63	4	1001000
48	66	4	0001000
48	69	4	0001010
48	72	4	0001000
48	75	4	1001000
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48	81	4	0001000
48	84	4	0001000
48	87	6	0001010
48	90	4	0001000
48	93	4	0001000
48	96	6	0001010
48	99	6	0000010
51	7	4	0001000
51	11	1	1001000
51	16	4	0001000
51	19	4	1001000
51	24	1	1001000
51	27	4	0001000
51	32	4	0001000
51	35	1	1001000
51	38	4	1001000
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51	46	4	1001000
51	49	4	1001000
51	55	4	0001000
51	58	4	1001000
51	65	4	0001000
51	68	4	0001000
51	87	4	1001000
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52	8	4	0001000
52	11	1	1001000
52	14	4	0001000
52	17	4	0001000
52	20	1	1001000
52	23	4	0001000
52	26	4	0001000
52	31	4	0001000
52	34	4	0001000
52	37	4	0001000

B	G	E	FVS
52	40	1	1001000
52	43	4	0001000
52	46	4	0001000
52	52	4	0001000
52	55	4	0001000
52	62	4	0001000
52	72	4	0001000
53	C	4	0001100
55	0	4	0001101
55	3	7	0001001
55	6	4	0001000
55	9	4	0001000
55	13	4	0001000
55	16	4	0001000
55	19	1	1001000
55	24	4	0001000
55	27	4	1001000
55	33	4	0001100
55	36	4	1001100
55	39	4	0001000
55	47	4	1001000
55	56	4	0001100
55	59	4	0001001
56	C	6	0001010
56	3	7	0000001
56	6	4	0001001
56	9	7	0000001
56	12	7	0000001
56	15	7	0001001
56	18	7	0001011
56	21	7	0001001
56	24	7	0001001
56	27	7	0001001
56	30	4	0001000
56	33	7	0001001
56	36	7	0000001
56	39	7	0000001
56	42	7	0000001
56	45	7	0000001
56	48	7	0001001
56	51	7	0000001
56	54	3	0010001
56	57	7	0000001
56	60	7	0001101
56	63	7	0000001
56	66	7	0010001
56	69	7	0001001
56	75	7	0000001
56	78	5	0010101
57	1	7	0001001
57	4	4	0001000
57	7	4	0001000
57	10	7	0000001
57	13	4	0001001

B	G	E	EVS
52	41	4	0001000
52	44	4	0001000
52	50	1	1001000
52	53	4	0001000
52	60	4	0001000
52	63	4	0001000
52	73	4	0001000
53	3	5	0001100
55	1	7	0001001
55	4	4	0001001
55	7	4	0001000
55	11	4	0001101
55	14	4	0001000
55	17	4	0001000
55	22	7	0001101
55	25	4	0001000
55	28	4	1001000
55	34	4	0001100
55	37	1	1001100
55	45	4	0001100
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55	68	4	0001100
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56	49	7	0001001
56	52	7	0000001
56	55	3	0010001
56	58	7	0000001
56	61	7	0001001
56	64	7	0000001
56	67	3	0010001
56	73	7	0000101
56	76	7	0010101
56	79	5	0010100
57	2	7	0001001
57	5	4	0001000
57	8	4	0001000
57	11	7	0001001
57	14	4	0001001

B	G	E	EVS
52	42	4	0001000
52	45	4	0001000
52	51	4	1001000
52	54	4	0001000
52	61	4	0001000
52	64	4	0001000
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55	8	1	1001000
55	12	7	0001001
55	15	4	0001000
55	18	1	1001000
55	23	4	0001000
55	26	4	0001000
55	29	4	1001000
55	35	5	0001100
55	38	4	0001000
55	46	4	1001000
55	49	4	0001001
55	58	4	0001000
55	69	7	0001101
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56	5	4	0001001
56	8	7	0001001
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56	14	7	0001001
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56	59	7	0000001
56	62	7	0000001
56	65	7	0000001
56	68	7	0000001
56	74	7	0000101
56	77	3	0010101
57	C	7	0000001
57	3	4	0001001
57	6	4	0001010
57	9	4	0001000
57	12	4	0001001
57	15	4	0001001

B	G	E	EVS
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57	19	4	0001000
57	22	7	0001001
57	25	7	0001001
57	28	4	0001000
57	31	7	0000001
57	34	7	0000001
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57	58	4	0001001
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57	64	7	0001101
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58	35	4	0001000
58	38	7	0001001
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58	47	7	0001001
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58	59	7	0000001
58	62	4	0001011
58	65	7	0000001
58	68	7	0000001
58	71	7	0001001
58	74	7	0001001
58	77	7	0001101
58	82	5	0001101

B	G	E	EVS
57	17	4	0001000
57	20	7	0000001
57	23	7	0000001
57	26	4	0001000
57	29	4	0001000
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57	35	7	0001001
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58	63	4	0001010
58	66	7	0000001
58	69	7	0000001
58	72	7	0001001
58	75	7	0000001
58	78	4	0001101
58	83	4	0001001

B	G	E	EVS
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57	21	7	0000001
57	24	7	0001001
57	27	4	0001000
57	30	7	0000001
57	33	7	0000001
57	36	4	0001000
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57	45	7	0001001
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57	54	7	0000001
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57	60	7	0001010
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57	69	7	0001001
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58	61	7	0001001
58	64	7	0001011
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58	70	7	0001001
58	73	7	0001001
58	76	7	0001001
58	79	4	0001101

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13. ABSTRACT <p>A ten percent random sample of map data is judged adequate to reproduce the first order spatial characteristics of the distribution pattern for the seven major types of depositional environments in the Mississippi Delta region of Southeast Louisiana. This conclusion is based on; 1) dendrographs which portray interdistance relationships among mean coordinate locations for the different environments, 2) the sampling properties of the Goodman-Kruskal measure of cross association as it is applied to nearest unlike neighbor samples, and 3) proximal maps which are reconstructions of the original pattern based on sample data.</p> <p>In analyzing map patterns, principal component analysis can be used to depict spatial trends. Within the Mississippi Delta region, the natural levee, point bar, bay-sound, and beach environments show a marked linear trend whereas the swamp, lacustrine, and marsh environments are more isotropic. With respect to location, the lacustrine environment is situated in an intermediate position between nonmarine and marine depositional environments.</p> <p>The total sample of 4025 data points taken from the environment distribution map of the Mississippi Delta region on which this study is based is contained in the Appendix.</p>		

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Environmental pattern reconstruction						
Mississippi Delta						
Nearest neighbor theory						
Pattern recognition						
Proximal mapping						
Random sampling						
Spatial analysis						

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